THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Heavy buying of pig iron continues, and the strength shown for some weeks in steel-making irons is now more general in foundry grades. While foundry furnaces have not yet encountered such a buying movement as that of November, 1900, or of March, 1901, there is free contracting for 1902, and the recent advance in prices is generally sustained. Southern sellers who recently made an advance of 50 cents a ton have intimated that if present demand is maintained in the next two weeks a further advance is a probability. Much will depend on the course of Northern makers, who are now selling in some districts below the delivered prices of Southern iron. The business of the week has been well scattered. In the Chicago district implement makers have been in the market for large amounts, which come on the heels of liberal buying by malleable interests. In the Central West further large purchases have been made by the United States Steel Corporation, about 30,000 tons of basic iron for this year's delivery having been taken. An independent steel company has also bought basic iron. The result is that the supply of Northern basic is practically taken up for the remainder of the year, and Southern sellers have named a Birmingham price of $12, equivalent to $16.15, Pittsburg. Bessemer iron is firm at $15.25 at Valley furnace. Further sales have been made in the Pittsburg district, and we note a sale of 25,000 tons by an Ironton, O., furnace to a steel works in the same district. It is understood that there has been some feeling of the market for basic iron for delivery in the first quarter of next year. Notwithstanding the enormous output of steel, there is still a scarcity of billets for early shipment, and $26 is paid, though contracts for the first quarter of 1902 can be made at $24, Central Western mill. Finished material markets all show great activity accompanied by firm prices. The rail business for next year has been further increased in the week and it is now certain that 1,000,000 tons of rails are on the books for 1902 delivery, estimating the tonnage that must be carried over. By those in touch with this business it has been estimated that 2,000,000 tons will be closed before the new year begins—a record altogether without precedent. A number of roads are mentioned whose requirements for 1902 will be considerably beyond the average for recent years. The Ensley, Ala., rail mill will not be in position to roll for the market before January. Eastern and Western bar iron manufacturers have made an arrangement by which a basis of 1.55c, Pittsburg, will be maintained, Youngstown mills quoting 1.50c at mill for Eastern and 1.60c at mill for Western business. The demand for bars is still heavy and agricultural, car works and railroad contracts of the past two weeks have amounted to a large aggregate. The books of structural mills show an unprecedented volume of orders, of which 50,000 tons are for delivery in January and February of next year. At Chicago the Rock Island depot and train sheds, calling for 9,500 tons, are about to be placed. The report of 1,500 tons of sheets imported by the Westinghouse interests from Germany makes unwarranted ado about a special quality. The shipment is simply a relic of the recent strike. Our exports of iron and steel decline sharply with each month. The exhibit for August shows 80,000 tons decline on pig iron and finished material from August, 1900. That this tonnage has not been missed is but one phase of the surprising home consumption.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, Oct. 9.

The constituent companies of the United States Steel Corporation have been making big purchases of basic iron during the past week for delivery during the remainder of this month, November and December. Nearly all the available basic iron in the two Valleys has been purchased and practically all the basic offered in the South has been secured. It is estimated that the entire purchases of basic during the week amount to 30,000 tons and negotiations are still on for additional tonnage. Of the amount named Southern producers have taken nearly 20,000 tons at $12 at the furnace which would make the Pittsburg delivered price $16.15. This price would not have been paid but for the fact that the indications point to a scarcity of basic iron during the month of December. What little basic is still being offered by the Valley furnaces is being held as high as $15.50, delivered, Pittsburg. About two weeks ago Southern basic was selling at $11 a ton at the furnace. Only within the past week has the price been advanced $1 per ton, while Northern furnaces have advanced their prices 25 to 50 cents a ton. It is understood some basic iron has been sold also for delivery to an independent Shenango Valley plant.

Bessemer iron is being firmly held at $15.25 per ton. Sales of about 10,000 tons have been made during the week at that price. Forge and foundry irons are also strong and prices are much firmer than they have been for some time.

Additional rail tonnage placed during the past few days brings the total for delivery next year, together with the tonnage carried over, to nearly 1,000,000 tons. Never before have the rail mills carried such a large tonnage on their books during the month of October for delivery the following year, and it is generally believed by the rail producers that the 2,000,000 ton mark will be reached before the end of November. Owing to the absence of a number of members of the rail pool no meeting was held last week, but it is expected that one will be held in the near future.

In finished lines, structural material next to rails shows the most activity. It is estimated that the mills are carrying on their books 50,000 tons of material for delivery during the months of January and February and this large tonnage coupled with the general business in shapes insures the full operation of the structural mills throughout the winter and spring months.

At the meeting of the steel plate manufacturers held in New York last week ruling prices were reaffirmed. The market, however, does not show the same strength as in other lines and some of the Eastern mills are not carrying more than two weeks' business on their books. Some of the Western manufacturers are better fixed with respect to advance tonnage and are carrying a full month's business on their books. While the volume of new business in plates is very large, the capacity of the mills is so nearly equal to the demand that it is practically impossible for any large amount of business to accumulate.

An agreement has been reached between the Eastern and Western manufacturers of iron bars whereby a uniform price on bars will be maintained hereafter, based on 1.55c, Pittsburg,

for common iron bars. Heretofore the Eastern manufacturers have always sold at a price considerably lower than the Western manufacturers, and when there was any scarcity of bar business in the East, the West was invaded with the result that the quotations of the Western producers suffered.

Although the sheet and tin plate mills have been operating in full now for nearly a month, the scarcity of sheets and of tinned and black plates has not been materially relieved. Tin plate for immediate delivery continues to be held at $5.50 per box, while jobbers quote 3.90c to 4c for sheets from warehouse stocks. On the heavy gauges, No. 18 and thicker, the American Sheet Steel Co. is not promising deliveries in less than three months, while shipments on the lighter gauges are fully two months behind. The Westinghouse interests have just imported from Germany 1,500 tons of sheets, which were ordered several months ago, when the strike was on. Should the sheet market continue in its present condition for any length of time, no doubt other large consumers will also make importations for immediate consumption.

PIG IRON.—The feature of the pig iron market the past week has been the heavy buying of basic iron both in the South and from Valley furnaces for delivery the remainder of the year. That there will be a scarcity of basic iron during the month of December is already apparent and the constituent companies of the United States Steel Corporation have been covering their requirements. The amount placed is estimated at 30,000 tons and negotiations are still on for additional tonnage. The Southern iron was purchased at $12 at the furnace or $16.15 Pittsburg, which is relatively higher than the quotations of the Valley furnaces. The fact that this price was paid would indicate that little if any iron was available in either the Mahoning or Shenango Valleys. Bessemer iron also continues in good demand, round lots having been purchased during the week at $15.25 per ton. No. 2 foundry iron is being held pretty generally at $14.50 per ton for delivery the remainder of the year and the tonnage placed is estimated at 6,000. There has been little buying of forge iron here except in small lots, but something has been done by Valley mills. Gray forge is quoted at $13.75 to $13.85, Pittsburg. We revise our quotations as follows:

Bessemer, Valley	$15 25
Bessemer, Pittsburg	19 00
No. 1 Foundry	14 75 to 15 00
No. 2 Foundry	14 25 to 14 50
No. 3 Foundry	13 50 to 14 00
Gray Forge, Pittsburg	13 75 to 13 85
Chilled Basic, Valley	14 50 to 14 75
Chilled Basic, Pittsburgh	15 25 to 15 50

STEEL.—It is practically impossible to secure either Bessemer or open-hearth billets for delivery the next two months. The steel mills are consuming practically all the billets which they are producing and odd lots of billets and slabs which find their way on the market now and then command exceedingly high prices. Bessemer billets which can be had in small lots only are quoted at $26 to $27 per ton, while open-hearth billets are held as high as $28 per ton. Tin and sheet bars are held as high as $29 and $30 per ton. Steel rods are held at $34 per ton.

FERRO-MANGANESE.—Small lots of domestic manganese are selling at prices ranging from $55 to $60 per ton. Foreign manganese, 80 per cent, is quoted at $55 per ton.

SPELTER.—The spelter market continues strong and prices have been slightly advanced during the week. Prime Western grades are quoted at 4.10c, Pittsburg.

MUCK BAR.—Demand for muck iron is fair and the last sales made were $29.75 per ton.

SKELP.—The pipe mills of the National Tube Co. are consuming skelp about as fast as it can be produced, and with the independent pipe mills crowded with orders, the demand for skelp is strong. Steel skelp, both grooved and sheared is held at 1.90c to 1.95c, Pittsburg, while iron is held at 2c to 2.05c.

RAILS AND TRACK MATERIAL.—It is now estimated that the total tonnage of rails to be rolled next year already closed amounts to nearly 1,000,000 tons. Never before has the rail market been in so strong a condition in the month of October and it is an excellent barometer of the general conditions of the iron and steel market. The meeting of the rail pool called last week was not held owing to the absence of certain representatives, but it is stated that another appointment will soon be made. We make the following quotations: Standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 8 pounds, $45; 12 pounds, $38; 16 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $32. Track material: Spikes, 1.95c to 2c; track bolts, square heads, 2.40c; hexagon heads, 2.55c; fish plates, 1.50c to 1.60c.

PLATES.—The condition of the plate market is not as strong as might be desired by the manufacturers and at the meeting held last week in New York the fact was developed that some of the large Eastern manufacturers have only two weeks' business on hand, while the Western manufacturers can make delivery on all business within 30 days. The volume of new business in plates is very satisfactory, but the capacity of the plate mills is so large that without a big foreign demand, none of the manufacturers will be enabled to accumulate any large amount of future business. Prices are reaffirmed and are as follows: Tank plate, ¼-inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. M. B. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents, extra 100 pounds. Plates 3-16 of an inch in thickness, $1 extra; gauges Nos. 7 and 8, $3 extra; No. 9, $5 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

BARS.—The Eastern and Western manufacturers of iron bars have at last come to terms with the result that quotations on iron bars will hereafter be based on Pittsburg prices. Common iron bars are quoted at 1.55c, Pittsburg, while refined bars are held at 1.75c and upwards. Demand for steel bars continues good and except on small lots, deliveries on new business cannot be made before the first of the year. Our quotations follow: Bessemer bars, 1.50c; open-hearth, 1.60c; plow beams and cultivator beams, 1.50c, net; channels, angles, zees and tees, Bessemer, under three inches, 1.60c; over 3 inches, 1.70c. Common iron bars, 1.55c, Pittsburg; refined iron bars, 1.75c and upwards.

PIPES AND TUBES.—The National Tube Co. continues to make very satisfactory deliveries and is less than 60 days behind on any of its orders. Jobbers and independent manufacturers are no longer securing premiums except on special sizes for very prompt delivery. We make the following quotations, to consumers, carload lots, Pittsburg:

MERCHANT PIPE.

	Blk. Per cent.	Galvd. Per cent.
⅛ to ⅜ and 11 to 12 inches	61	48
½ to 10 inches	68½	56

BOILER TUBES.

Steel.

	Per cent.
1 to 1⅝ inches	47½
2¼ to 5 inches	65½
1¾ to 2¼ and 6 to 13 inches	60

Iron.

	Per cent.
1 to 1⅝ and 2½ inches	43½
1¾ to 2¼ inches	43
2¼ to 13 inches	53

CASING.

	S. and S, Per cent.
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¾ inches	65

SHEETS.—Deliveries of sheets from the mills of the American Sheet Steel Co. continue very unsatisfactory; on the heavier gauges they are still about three months behind. On the lighter gauges also deliveries are not catching up as was expected. This condition of affairs, however, is due entirely to the great demand for sheets. The new business that is being closed is said to be in excess of the daily output and prevents the mills from catching up on their orders. Spot sheets from warehouse stocks are quoted as high as 4c for No. 28 gauge, while No. 27 is quoted at 3.90c. Tin plates for immediate delivery are quoted at $5.50 per box, while for November delivery as high as $4.30 is quoted The American Sheet Steel Co. makes the following quotations to jobbers: On lots in 500 bundles or more of black sheets, one pass through cold rolls; Nos. 10, 11 and 12, 2.30c; Nos. 14 and 15, 2.40c; Nos. 16 and 17, 2.50c; Nos. 18, 19, 20 and 21, 2.60c; Nos. 22, 23 and 24, 2.70c; Nos. 25 and 26, 2.80c; No.

27, 2.90c; No. 28, 3c; No. 29, 3.15c; No. 30, 3.25c. On lots less than 500 bundles the American Sheet Steel Co. does not make shipments except through jobbers, and for direct shipments from mill in less than carload lots an extra charge of 10 cents per 100 pounds is made. Galvanized sheets are quoted at 70, 10 and 5 off in lots of 500 bundles and over, and at 70 and 10 in smaller lots; galvanized sheets for spot shipment, at 65 and 5 off. Quotations to consumers in lots of 500 bundles or more are $2 per ton above the quotations to jobbers. Independent manufacturers quote black sheets No. 28 gauge for future delivery at 3.35c.

STRUCTURAL MATERIAL.—We can state that the structural mills of the country already have on their books fully 50,000 tons for delivery during the months of January and February next year. New business cannot be delivered in less than 90 days and the volume of current business that is being closed daily insures a strong market throughout the winter and spring months of next year. Quotations are unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—Independent manufacturers of wire and wire nails are making slight concessions from the prices quoted by the American Steel & Wire Co. Despite these the market is strong and demand is heavy. Quotations are unchanged as follows: Single carloads of wire nails to jobbers, $2.30, Pittsburg; to retailers, $2.40; plain wire, carload lots, is quoted at $2.25 to jobbers and $2.35 to retailers; painted barb wire, $2.60 in carload lots to jobbers, and $2.70 to retailers; galvanized barb wire, $2 in carload lots to jobbers, and $3 to retailers. Cut nails are quoted at $2.05, Pittsburg, in carload lots, 2 per cent off in 10 days.

MERCHANT STEEL.—The demand for tool steel of all grades is very heavy and contracts are already being placed running throughout the month of April. We continue the following quotations: Turned, cold rolled and ground shafting is quoted at 60 per cent off for car lots and 55 per cent off for less than car lots; tire steel in carload lots and over, 1.60c; less than carload lots, 1.75c to 1.80c. Toe calk is sold at 1.70c in large lots, and in small lots as high as 1.85c. Tool steel is held at 7c and upwards, according to quantity.

OLD MATERIAL.—We note the sale of 500 tons of old steel rails at $17 per gross ton, and 500 tons of heavy steel scrap at $16.25 per ton. We make the following quotations, gross tons: Heavy melting stock, $16.25 to $16.50; low phosphorus melting stock, $17 to $17.50; steel rails, $16.75 to $17; bushcling scrap, $13 to $14; No. 1 wrought, $17 to $17.25; iron rails, $21 to $21.50; cast borings, $7.50 to $7.75; cast scrap, $13.50 to $14.

COKE.—Just at present the coke operators both in the Connellsville region and in the mountain districts are experiencing much difficulty in securing cars to make shipments. For the week ending Saturday, Sept. 28, the output of the Connellsville region amounted to about 224,000 tons, an increase over the previous week of about 3,000 tons. The shipments from the region for the week amounted to 10,449 cars. Connellsville furnace coke is quoted at $2 per ton, and foundry coke at $2.40 to $2.50 per ton. Outside furnace coke is sold at $1.60 to $1.75 and foundry at $2.10 to $2.25.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
534 MONADNOCK BLOCK, Oct 8.

The buying of pig iron continues to be the most noteworthy feature of the market is this locality. While the tonnage booked is not quite as large as that of last week, it is nevertheless of large proportions. Malleable foundries have been doing the largest buying, it being estimated that in the neighborhood of 30,000 tons have been sold to these since our last report. Agricultural implement manufacturers and the general foundry trade have also bought about 20,000 tons of foundry irons. Northerns furnaces have taken most of this business, the price of Northern irons, being on an average about 15 cents a ton less than that of Southern irons. All commission houses representing Southern furnaces report that business during the past week has been rather light, the recent increase in price being assigned as the cause. There is very little Northern iron to be had for prompt shipment, and to stimulate buying for this material, deliveries to commence with January of next year, it is reported that Northern sellers are offering iron at about 50 cents a ton less than is asked for prompt shipment. Southern furnaces, however, are still in position to make quick delivery of material. Some sellers of Northern irons report that if the present heavy demand keeps up, an increase of price will go into effect shortly. Most of the Northern furnaces have but little tonnage left for sale. In finished materials there is little change to note. There has been considerable buying in rails, bars and structural material. During the past week, car builders placed orders for about 6,000 tons of bars, and business from the general trade was exceptionally good. It is expected that the Chicago & Rock Island will place contracts for the new depot and train shed to be built on the site of the present one in this city this week. These, it is estimated, will require between 7,000 and 10,0000 tons of steel. The demand for structural steel from jobbers' stocks has been phenomenal, to quote the words of one seller, and some large orders have been taken by the mills, the contracts ranging from small lots to 3,000 tons. Railroads continue to place specifications for rails freely, and a large tonnage has been booked since our last report. A healthy demand for scrap prevails and prices are firm.

PIG IRON.—Northern furnaces have had the benefit of practically all the buying that has been done during the past week, this being due to the fact that since the recent increase in Southern iron, there is a difference of 15 cents a ton in favor of the Northern material. All the Southern sellers report that the tonnage booked by them has been very light, while sellers of Northern irons have booked orders for about 30,000 tons of malleable and 20,000 tons of foundry irons. Northern iron for prompt shipment is very scarce, and in view of the heavy demand of the past two weeks, some sellers look for an increase in prices in the near future. Most of the buying is still confined to the agricultural implement and malleable trade. We quote as follows:

Lake Sup Charcoal	$17 50 to $18 00	Southern Coke No. 4	$13 65 to $13 90
Local Coke Fdy. No.1	15 50 to 16 00	Southern No. 1 Soft	15 15 to 15 45
Local Coke Fdy. No.2	15 00 to 15 50	Southern No. 2 Soft	14 65 to 14 90
Local Coke Fdy. No.3	14 50 to 15 00	Southern Silveries	15 40 to 15 60
LocalScotchFdy.No.1	15 50 to 16 00	Jackson Co. Silveries	17 00 to 17 50
LocalScotchFdy No.2	15 00 to 15 50	OhioStrong Softeners	16 50 to 17 00
LocalScotchFdy.No.3	14 50 to 15 00	Alabama Car Wheel	21 00 to 22 00
Southern Coke No. 1	18 40 to 15 65	Malleable Bessemer	16 00 to 17 00
Southern Coke No. 2	14 65 to 14 90	Coke Bessemer	17 50 to 18 50
Southern Coke No. 3	14 15 to 14 40		

BARS.—Mills report that business has been exceptionally good, including a number of large transactions. Car builders have been buying freely, contracts having been placed aggregating 6,000 tons. One of the most gratifying features is the large number of average orders from the general manufacturing trade, these calling for delivery well into next year. We quote steel bars for immediate shipment, 1.75c to 1.80c Chicago, and iron, 1.70c Chicago. Out of store, steel and iron, 2c; on contracts for large lots and extended deliveries, steel, 1.65c, and iron, 1.60c.

SHEETS.—There is little change to note in the demand for this material. Mills are beginning to make shipments on orders placed prior to the strike, and jobbers' stocks are being replenished. This has relieved the stringency somewhat, though new business cannot be delivered from the mills within three months. We quote as follows: No. 27 black, 4.10c to 4.25c, and galvanized 65% from store.

STRUCTURAL STEEL.—A good tonnage has been booked in the past week, the orders ranging from small lots to 3,000 tons. Owing to the fact that mills are about five months behind in delivery of material, the demand from jobbers' stocks has been very large. Some large contracts are still pending, notably that to be placed by the Chicago & Rock Island for its new depot and train shed to be built on the site of the present one in this city. It is estimated that the train shed will require about 7,000 tons of material and the depot about 2,500 tons. We quote mill shipments, carload lots, as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 1.75 to 1.80c; plates, 1.75c, base; tees, 1.80c; zees, 1.75c; small lots from store, ¼c higher; beams and channels from store, ½c to ¾c per pound higher.

RAILS AND TRACK SUPPLIES.—There has been considerable buying of rails of standard sections, and mills are rapidly selling their capacity for the next year. The demand for track supplies and light rails also keeps up very good, though de-

liveries on new business for the latter cannot be made for several months. There is a good demand for spikes, railroads placing large orders for this material. Our quotations follow: Standard rails, $28; light sections, $33 to $35, according to size; out of store, $40 to $44 splice bars, 1.60c to 1.70c; spikes, 1.90c to 2c; out of store, 2c; track bolts, hexagon nuts, 2.80c to 2.90c; out of store, 2.90c to 3c; square nuts, 2.65c to 2.75 c; out of store, 2.75c to 2.85c.

BILLETS.—It is very difficult to get either open-hearth or Bessemer billets, though a few sales of both have been made. We quote Bessemer billets, $31 to $33, and open-hearth, $33 to $35.

MERCHANT STEEL.—A continued good business is reported in this material, though mills would be able to secure many more orders if they could only furnish materials. With their capacity sold far ahead, mills are not pushing out for new business of any kind. Our quotations for mill shipments, Chicago delivery, follow: Smooth finished tire steel, 1.90c to 2c; open-hearth spring steel, 2.50c to 2.75c; toe calk, 2.40c to 2.60c; sleigh shoe, 1.85c to 1.90c; cutter shoe, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards. Cold rolled shafting, carload lots, 55 per cent and upwards.

PLATES.—The general business has been good, though with mills behind in delivering material, the buying has not been as heavy as it might be. Our quotations follow: Tank steel, base, ¼-inch, 1.75c; flange steel, 1.90c to 2c, marine steel, 1.95c; firebox steel, ordinary, 2c to 2.10c; special, 2.25c and upwards. Tank steel from store, 2c to 2.20c; flange steel from store, 2.25c.

MERCHANT PIPE AND BOILER TUBES.—With jobbers' stocks being replenished and mills making shipments direct to consumers, there is a better feeling all round. A fairly good business is reported, and prices are gradually being decreased. We revise our quotations as follows:

MERCHANT PIPE, RANDON LENGTHS.

	Black Per cent.	Galv. Per cent.
⅛ to ¼ and 11 to 12 in.	56	42
⅜ to 10 inches	64	50

BOILER TUBES.

	Steel Per cent.	Iron Per Cent.
1 to 1¼ in.	40	35
1¼ to 2½ in.	45	40
2½ to 5 in.	55	50
6 in. and larger	45	40

WIRE AND WIRE NAILS.—The local interest reports that business could not possibly be better. There is a heavy demand for all kinds of wire products and wire nails, and with stocks practically depleted all over the country, it is impossible to satisfy the demands for prompt shipment of material. Our quotations are: Carloads of wire nails to jobbers, $2.40, Chicago; to retailers, $2.50; plain wire, carload lots to jobbers, $2.35; to retailers, $2.45; painted barb wire to jobbers, carloads, $2.70; to retailers, $2.80; galvanized barb wire, carloads to jobbers, $3; to retailers, $3.10.

OLD MATERIAL.—Prices are very firm and there is a good demand for material. Our quotations follow:

Old iron rails	$21 00 to $21 50	Old Wheels	$16 00 to $16 50
Old steel rails, long	16 00 to 17 00	Heavy melting steel	13 00 to 14 00
Old steel rails, mixed	13 50 to 14 50	Mixed country steel	10 00 to 10 50
Relaying rails	24 00 to 25 00		

The following are selling prices per net ton:

No. 1 R. R. wrought	$16 25 to $16 75	Iron axles	$20 50 to $21 00
No. 2 R. R. wrought	13 50 to 13 75	Cast borings	4 50 to 5 00
Dealers' forge	12 50 to 13 00	Wrought turnings	10 00 to 10 50
No. 1 busheling	10 50 to 11 00	Iron axle turnings	11 50 to 12 00
Heavy cast	11 00 to 11 50	Steel axle turnings	9 50 to 10 00
Railway malleable	12 00 to 12 50	Stove plates	7 50 to 8 00
Country malleable	10 50 to 11 00	Old iron splice bars	16 50 to 16 75

CLEVELAND

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, Oct. 9

The statistics of iron ore shipments have been noted with interest by ore selling firms in the past week. The total movement from all upper lake ports in September was 2,893,669 gross tons, against 2,519,043 tons in September, 1900—an increase of 374,626 tons. For the season up to Sept. 30 the shipments this year were 15,157,105 tons, as compared with 14,885,065 tons to Sept. 30, 1900. This is an increase for the season of 1901 over 1900 to the same date, of 272,040 tons, or 1.83 per cent. Estimates on the season's total are beginning to be made. They fall somewhat under 20,000,000 tons for water and all-rail shipments. Last year the movement by lake was 18,570,315 tons, the all rail shipments bringing the total up to 19,059,393. If unsold ore comes down to a fair amount this year, the next two months might readily yield a total of 4,500,000 tons by water. It is evident that furnacemen have yet to buy considerable ore, both Bessemer and non-Bessemer, to carry them up to the opening of navigation next year. There has been a fair amount of buying in the past month, and sellers have now comparatively little to offer. On some of the best Bessemer ores of the Mesabi range advances of 15 and 20 cents over early prices have been obtanied in these recent transactions.

PIG IRON.—Foundry iron in particular has been a feature of the market in the past 10 days. The molders' strike of the second half of 1900 and the early weeks of this year postponed deliveries on a large amount of iron then under contract, and there has been no heavy buying movement this year in Cleveland until the present one came on. In a few cases 1,000-ton purchases have been made, deliveries on these extending to the middle of next year. Valley furnaces are quite generally sold up on foundry iron for the balance of this year and are not pressing business for 1902, though at current prices orders are being booked for first quarter and to a less extent for first half. There is more Southern iron than Northern available for shipment this year, but on all such sales Southern furnaces are getting the advanced prices which put their product somewhat above the Northern basis. From the low point of $13, which was a possibility two months ago from weak sellers, the advance is substantially 75 cents. Present quotations on No. 2 run from $13.75 to $14 at Valley furnace, while sales of No. 1 are reported at both $14.25 and $14.50. The activity in foundry grades seems to be general, and the business is very largely for delivery next year. Foundries are very busy and show no signs of running out of work at any early day. Forge iron has been more active in the week also, and is now generally quoted at $13.25 in the Valley, though a good sale at Pittsburg is reported to have been at $13.75, Pittsburg. In basic iron more business has been done, chiefly through Pittsburg offices. Though sales were made last month at $14.25 in the Valley, delivery through this year, the present price is $14.75 on Northern chilled basic, while Southern has been quoted on a Pittsburg basis more than 50 cents higher, and sales are reported at $12, Birmingham. Bessemer iron is firm at $15.25 at Valley furnace and some additional business is reported. We quote the Cleveland market as follows:

Bessemer	$16 00	Valley Scotch No. 1	$15 00 to $15 25
No. 1 Strong F'dry	14 75 to 15 25	Valley Scotch No. 2	14 50 to 14 75
No. 2 Strong F'dry	14 50 to 14 75	Gray forge, Valley	13 25
No. 3 Foundry	14 00 to 14 25	Lake Superior charc'l	17 00 to 17 50

FINISHED MATERIAL.—An advance in iron bars, under an agreement between Eastern and Western sellers has been made in the week making the price, 1.55c, Pittsburg, instead of 1.55c, Youngstown, as before. For buyers west of Youngstown this means an advance of about 85 cents a ton. Cleveland buyers, for example, have paid a freight of 4¼ cents a hundred from Youngstown, while from Pittsburg the freight is 8½ cents. The demand for both steel and iron bars keeps up well, and agricultural, car works and railroad consumption is at high point. We note a good business locally in structural material, the replenishment of stocks at structural works in Cleveland calling for upwards of 1,200 tons, and there is no sign of the usual let-up expected at the closed season. Plates are rather quiet and mill capacity seems equal to the demand in a way that is true of no other product. Consumers of sheets still have trouble with deliveries and the congestion at the mills is unremedied. We quote the Pittsburg market in carload lots to consumers as follows: No. 12, 2.40c; No. 16, 2.60c; Nos. 22, 23 and 24, 2.80c; No. 27, 3c; No. 28, 3.10c; galvanized sheets for spot delivery, 65 to 5 off. Some inquiry is reported for rails for electric railway construction.

OLD MATERIAL.—The market is substantially unchanged from last week, though with somewhat more firmness in melting steel, and the activity in foundry iron has caused scrap dealers to refuse prices that would have been entertained a few weeks ago. Dealers' quotations, all for gross tons, are as follows: Old steel rails, $16 to $17; short lengths, $15.50 to $15.75; old iron rails, $21; old car wheels, $15.50; No. 1

railroad wrought, $16 to $16.50; mill scrap, $14 to $15; No. 1 machine cast, $14; cast borings, $7 to $7.50; grate bars, $9; sheet iron, $9 to $9.50; stove plate, $9.75 to $10.

CINCINNATI.

Oct. 8

Trade conditions have been very satisfactory during the past week both in the market for iron and finished material. In iron there have been some changes, Northern irons being quoted up a shade in sympathy with the general movements. In finished material there has been an advance of $1 a ton in bar iron and a feeling of strength all along the line. The situation in business is good. Almost all lines in the Cincinnati district are doing well, and manufacturing industries in particular are prosperous. The exception as far as this city is concerned is the carriage trade, which is tied up on account of the strike of the employes, which has been going on for several weeks. The manufacturers have closed down for an indefinite period, pending a chance to open up again with all non-union men. There has been some interference on the part of the union men with the non-union workers, and although the police have refused to allow the strikers to congregate about the factories, there is a good job of picketing being done, and there are several cases reported where non-union men on their way home have been waylaid and beaten. This condition of idleness does not extend to any other trade, and there is no effect noticeable as yet on other lines.

About a week ago it was reported that the mill of the Republic Iron & Steel Co. here was to be closed down at the same time that other changes were to be made by the company here. L. A. Burrell was appointed district sales agent to succeed A. W. Houston, who was elected vice-president, and it was reported that with the closing of the mill, Manager D. W. Jones would go to some other branch. This is evidently not the case, as contracts have been given out for raw material on which to run the mill and it is understood that the manager has been reappointed to remain here.

There has been an intimation that the Riverside mill of the American Tin Plate Co. would be started up again before long. The mill was dismantled to a large extent soon after it went into the combine. The truth of the statement could not be learned.

PIG IRON.—The demand for pig iron has continued as firm as before the advance week before last on all grades of Southern iron. Consumers with contracts have been calling loudly for iron and contracts into the first half of 1902 have been made in reasonable amounts. Prices are fully maintained on all grades and there have been advances on Northern foundry grades in line with the advances on Southern grades. Furnace stocks show no signs of being added to and the stocks of the consumers are getting lower, judging from the way they are trying to hurry up deliveries. Furnaces are not eager to load up their books with contracts any faster than they are now doing, and some iron men say that if the present general demand keeps up they will advance their prices farther. The orders have been distributed pretty well over the list, buying of malleable and Northern irons keeping well up with the demand for Southern grades. There have been some good sized bookings during the week, several orders for 2,000 and 3,000 tons being placed. The melting capacity has been added to in Cincinnati by the Norwood foundry that ran its first heat today, and that placed an order a few weeks ago for 3,000 tons on which to work from the present time. Following are prices f. o. b. Cincinnati:

Southern Fdy. No. 1	$14 00 to $14 25	Gray Forge	12 25 to 12 50
" " 2	13 50 to 13 75	Northern Fdy. No. 1	$15 35 to $15 60
" " 3	13 00 to 13 25	" " 2	14 85 to 15 00
" " 4	12 50 to 12 75	Charcoal C. W. iron	18 00 to 18 50
So. Fdy. No. 1 soft	14 00 to 14 25	Malleable coke iron	15 00 to 15 25
So. Fdy. No. 2 soft	13 50 to 13 75	Jackson Co. Sil'y No. 1	15 50 to 16 00

FINISHED MATERIAL.—The only change in market prices on finished material was the advance of $1 a ton on bar iron, made on Saturday, to 1.55c at Pittsburg, which is equivalent to 1.67c Cincinnati. The demand on the part of manufacturers continues to be very good and there is still a good deal of trouble about getting deliveries on orders. Plates and sheets are causing most of the trouble and the mills are not making any promises as yet. Manufacturers are generally very busy and the demand for the material is urgent. Iron stores have small stocks and some of them are cleaned up of every lot of plates and sheets that they had. There have been no large contracts let for material, but the frequency of the orders shows that the manufacturers have nothing to go on and are anxious to get material. Following prices are quoted for Cincinnati: Iron bars, 1.67c, and 1.90c out of store; steel bars, 1.65c; angles, 2c; plates, 1.85c to 1.90c; sheets No. 28, 3.35c to 3.40c and 3.95c out of stores; sheets, No. 12 blue annealed, 2.35c, and 2.70c out of store.

OLD MATERIAL.—In sympathy with the firm market and advancing prices of pig iron there has been a more active demand for scrap and higher prices have been paid for some of the material offered. The demand for old rails has been especially good though prices have not shown much of an advance. Wrought scrap has shown a tendency to advance. Following are prices on scrap at Cincinnati:

Old No. 1 Wrought Railroad	$ 14 25 to 14 75
Cast Machine and Foundry	12 25 to 12 75
Old Iron Rails	17 75 to 18 50
Old Steel Rails	14 75 to 15 25
Old Short Lengths	13 75 to 14 00
Old Iron Axles	19 50 to 20 50
Old Iron Car Wheels	17 50 to 18 00
Stove Plates	9 75 to 10 00
Wrought Turnings, net tons	12 00 to 12 25
Cast Borings, net tons	7 00 to 7 50

PHILADELPHIA.

Oct 8.

Several furnaces have withdrawn from the market for the balance of the year, and the situation is decidedly strengthened. Complaints are heard of the scarcity of standard brands of foundry iron, and a small advance is readily secured for these where delivery can be made on short notice.

The higher cost of old material together with a uniform advance of wages at the mills is causing a firmer feeling in bar iron, which will probably result in a small advance being made in the near future. The demand for steel yet exceeds the supply and lower prices are not looked for for some time to come.

PIG IRON.—The market in its present stage is controlled by the sellers, and while advances come slowly there is every indication that during the week nearly all transactions have been closed at outside figures. Nothing has as yet taken place to permanently fix the value of iron beyond the current year, and until actual sales are closed both sides will be able to claim advantages. As near as can be ascertained prices for deliveries beyond Jan. 1 range about as follows for Philadelphia and nearby points: No. 1 X foundry, $15.50 to $16; No. 2 X foundry, $14.90 to $15.50; No. 2 plain, $14.50 to $14.75; standard gray forge, $13.75 to $14; ordinary gray forge, $13.25 to $13.50; basic (chilled), $14 to $14.25.

FINISHED MATERIAL.—Bars are very strong and the announcement of a dollar per ton advance is expected in a few days. This is fully warranted by increase in both wages and cost of material, which have lately left but a moderate margin of profit to the manufacturer. Plates are easier, with plenty of work for the present. Sheets and structural material appear to be as scarce as at any time and premiums are promptly paid for reasonable early deliveries. Prices range about as follows for this city and vicinity: Plates, ¼-inch and thicker, 1.75c to 1.80c; bars, iron, 1.65c to 1.70c; bars, steel, 1.62½c to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

OLD MATERIAL.—The market is very strong for all descriptions, especially for steel. Bids and offers are about as follows for deliveries in buyers' yards: Choice railroad scrap, $19 to $20; ordinary light scrap, $12.50 to $13.50; machinery cast, $13.75 to $14.50; heavy steel scrap, $17.25 to $17.75; old iron rails, $19.50 to $20; old steel rails, short lengths, $17.50 to $18; wrought turnings, $11.75 to $12.25; cast borings, $7.25 to $7.75; old car wheels, $16.50 to $17; old iron axles, $23 to $24; old steel axles, $20 to $21.

The exports of iron ore from Sweden reached 1,619,910 tons in 1900, as compared with 1,688,000 tons in 1899, 1,439,860 tons in 1898, and 1,400,801 tons in 1897. The port of Lulea shipped 1,054,675 tons, and Nikoping 531,908 tons last year. The destination is shown by the following figures: Finland, 18,731 tons; Germany, 422,625 tons; Holland (also for Germany), 967,249 tons; England, 102,771 tons; Belgium, 99,125 tons; and France, 9,400 tons.

THE IRON TRADE REVIEW

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THE STEEL CORPORATION'S EARNINGS.

The publication of the statement of the United States Steel Corporation's earnings for six months ending with September has led to a vast deal of comment by newspapers and financiers The net earnings for the six months, with September estimated, are shown to be $54,954,871, or an average of more than $9,000,000 a month. That the August earnings were $9,810,880, or $200,000 greater than those for the largest preceding month; that the July earnings were $9,580,151, and the September estimate slightly greater than the average for the six months, has been a matter of no little surprise, as these were the months of the steel strike. It has been intimated that the showing is a bookkeeper's showing, also that the July, August and September figures represent receipts in those months on old shipments (an impossible assumption), and it is asserted that later months will show what the strike did in killing tonnage and earnings.

It will scarcely be claimed that the earnings of the company would not have been greater for July, August and September had not the strike taken place; but that is quite different from the fact shown by the statement, that the earnings for these months were up to and somewhat more than those for the three months preceding. It is to be remembered that prices have been advanced in the last six months. One wage settlement of the Republic Iron & Steel Co. in the past summer has given the men an advance, based on the increased average price of shipments in a two months' period, as compared with those in the preceding two months. The low priced business in bars and in other products taken in August, 1900, has been worked off the books and the effect of higher prices is seen month by month. There was also during the strike a very heavy operation of the mills unaffected. There cannot be much in the explanation put forth in some quarters that the strike was the occasion for working off odds and ends at high prices. The amount of such material at the mills affected by the strike was insignificant. One fact which most if not all the financial analysts have overlooked is that the Shelby Steel Tube Co., which was formally added to the United States Steel Corporation in August, helped to keep the earnings up to those of other months.

What is said above bears on the statements that have sought either to make the remarkable showing of earnings meaningless, because of presumably suppressed items, or that have charged manipulation for favorable effect. Other comments have referred to the action of the steel corporation as praiseworthy, in view of the general mystery about industrial stocks, and have then fallen to figuring the average profit per ton on the steel company's output. At, say, 8,000,000 tons output a year, with an allowance for tonnage cut off by the strike, the figures represent an average of $14 net earnings per ton. Considerable raw steel is included, at a less profit than $14, and on products like wire, nails, sheets and tin plates the average ran above the figure named.

That this scale of profits will be thoroughly discussed at Washington the coming winter, if Representative Babcock's bill abolishing many iron and steel duties ever gets before the House, there is no doubt. The United States Steel Corporation in publishing its statement shows that it views with little alarm the agitation for the removal of iron and steel tariffs. We have always contended that home competition is the best protection the home buyer can have against exorbitant prices and that the tariff is the best guarantee of such competition. Of all our steel companies probably none has less need of the tariff than the United States Steel Corporation. It will be shown, we believe, if the Babcock bill comes to a serious discussion, that the chief sufferers from its enactment will be the companies whose resources are less and costs of production greater than those of the world's greatest corporation.

It would be a short-sighted policy to found legislation such as Congressman Babcock proposes on the earnings of this banner year in the history of our steel trade—a banner year both in production and in average price of steel products sent to market; for, while 1899 saw higher prices, they were the basis on which a relatively small tonnage was sold. It should not be forgotten that the steel trade has seen times in which it was stripped of all profit and consumers had all the so-called benefits of cheap steel. Billets have sold as low as $13.50 at Central Western mill, yet that price was the sign of an impoverished steel industry, of impoverished consumers and of impoverished labor. Those critics who rail at our steel manufacturers because in their effort to get a foothold abroad and teach the foreign consumer to use American steel, our manufacturers make a lower price on some exported steel than is paid at home, need to remember what low-priced steel at home has always meant and always will mean. If the domestic price of steel products is inordinately high, as in 1899, two good remedies are at hand, without destroying our tariff and giving foreign steel works a chance to retaliate upon us by slaughtering their surplus at opportune times. One remedy is in the refusal of the public to buy at high prices, and of investors to carry through new enterprises calling for iron and steel. Another is in the competition that high prices and large profits always encourage. Both

remedies were resorted to in 1899. The result was on the one hand a decline in prices, beginning in November, 1899, and extending well into the fall of last year. On the other hand was the starting of a crop of new iron and steel works from which something has already been heard, with more to be developed in the next twelve-month.

Year in and year out the history of iron and steel manufacture in the United States has demonstrated that whatever is taken from consuming interests in unusually high prices for a time of rapidly expanding demand is given back in reactions that for the most part have carried prices to new low levels. More recently, through a more concentrated control, which has by no means eliminated competition, but in some directions has stimulated it, there has been a tendency to a more stable market. Domestic buyers have thus been given assurance that all would fare alike and that the uncertainties and violent wrenches of the old regime would disappear. If our steel manufacturers fail to use their power wisely the greater hurt will be on their own heads. But it needs to be remembered by those who have been quick to plan a program of legislation on the basis of the steel corporation statement, that the last 10 years of our industrial history have shown vastly more alarming and more harmful things than this exhibit of a half year's prosperity in the king of industries.

FOREIGN TIN PLATE AND THE STEEL STRIKE.

How little truth there was in the story which gave labor leaders so much concern last July, to the effect that the American Tin Plate Co. had some 7,000 tons of black plates coming to it from Wales, appears from the latest returns of the British Board of Trade. These show that during the months of July and August this year Great Britain shipped us the modest quantity of 216 tons of black plates for tinning, 181 tons in July and 35 tons in August. In each of the first three months of last year the shipments amounted to over 200 tons, so that there is no certainty that a single ton of these shipments had even the remotest connection with the strike. A great deal of discussion was indulged in on the question whether the Tin Plate Workers' International Protective Association would work up the large quantity of black plate which it was claimed the American Tin Plate Co. was bringing over in order to prevent a scarcity and break the strike. The actual quantity brought over in July and August would not keep the company's largest tin house in operation for a full week.

In finished tin plate, however, England lent some assistance to the United States, but the quantity was surprisingly small when it is considered that spot plates brought a premium of $1.50 a box in the United States by Aug. 1 and from $2.50 to $3 later on. The shipments of tin plate to the United States from Great Britain were 8,608 long tons in July and 8,508 tons in August, a total of 17,116 tons. The average shipments in the same months in the four years 1897-1900 were 9,597 tons, the smallest being 9,010 tons, in 1897. So that the excess shipments in July and August this year were only 7,519 tons over the average. It cannot be held, the tin plate strike being only declared July 13, that there was not sufficient time to get the plates started on their journey, since the exports of August were 100 tons less than in July. The excess for the two months represents less than a week's normal production of the American Tin Plate Co.

HEAVY DECLINE IN IRON AND STEEL EXPORTS.

While mention has been made from time to time of the shrinkage of our exports of iron and steel since prices abroad have declined and the home demand has been so great, probably the extent of the falling off has not been appreciated. Last month we published a table showing that our exports of pig iron and the various forms of finished material in July, 1901, were 51,459 gross tons, as against 83,816 tons in July, 1900, a decline of 32,000 tons. The August showing makes the disparity much greater. For the materials enumerated in the table below, the falling off is 80,000 tons from the record for August, 1900:

EXPORTS OF IRON AND STEEL FROM THE UNITED STATES.

	GROSS TONS.			
	August.		8 Mos. end'g Aug.	
	1900.	1901.	1900.	1901.
Pig Iron	30,865	2,230	120,612	46,795
Scrap	5,267	2,344	30,536	9 519
Bar Iron	588	073	4,807	15,376
Wire Rods	236	618	4,778	3 715
Steel Bars, (not wire rods)	13,809	1,702	37,667	20,177
Iron Rails	53	169	4,803	606
Steel Rails	33,906	18,304	256,276	249,281
Billets, Ingots and blooms	10,440	275	30,618	27 653
Hoop Band and Scroll Iron	279	15	836	1,009
Iron Sheets and Plates	322	307	6,250	5,317
Steel Sheets and Plates	5,301	1,227	22,964	20,940
Tin Plates, Terne Plates and Taggers Tin	5	3	73	406
Structural Material	8,404	2,021	46,702	36,223
Wire	4,862	5,573	55,246	53,812
Cut Nails	706	546	7,761	7,602
Wire Nails	1,984	1,485	21,955	13 385
Other Nails, Including Tacks	207	142	1,306	1,341
Total	118,296	37,636	653,110	512,557

In machinery the statistics make a similar showing August exports of metal working machinery were $1,912,379, against $4,712,225 in August, 1900, and $4,495,665 in August, 1899. The total value of iron and steel exports, including machinery, in August was $8,185,649, against $10,888,061 in August, 1900. For the eight months ending with August the total value was $69,346,379, against $87,174,209 in the first eight months of 1900 and $68,008,070 for the first eight months of 1899.

Crucible Steel Co. of America.

(Special Telegram.)

PITTSBURG, Oct. 9.—The Crucible Steel Co. of America has practically decided to locate a number of merchant bar mills at Clairton, Pa., where three blast furnaces, an open-hearth plant and blooming and slabbing mills are building. One of the plans under consideration is to concentrate all the finishing mills of the company at this plant, but if this is not found desirable and feasible, several merchant mills will be erected to finish part of the product produced. The remainder in the form of billets will be distributed among the different plants of the company in the district and elsewhere. The open-hearth plant will probably be placed in operation about Jan. 1, while the first of the three blast furnaces will be blown in May 1 next year.

The New Bar Iron Basis.

(Special Telegram.)

PITTSBURG, Oct. 9.—Bar iron prices under the arrangements between Eastern and Western mills are based on 1.55c, Pittsburg. Quotations at Youngstown, O., are 1.50c for Eastern business and 1.60c for Western business. All quotations are made Pittsburg or Youngstown base plus the actual freight to points of delivery.

SHAFT WORK AT THE STONY POINT STEEL PLANT.

An interesting feature of the operations of the Lackawanna Iron & Steel Co. in the building of its blast furnace and steel plants at Stony Point, south of Buffalo, is the sinking of shafts and tunneling under the canal the company has dug to bring ore vessels up to its furnace yard docks. The tunnel is to convey gases from the coke ovens on the lake shore to the furnace plant for driving gas engines. It will also carry water and other pipes.

The shaft excavation was done under contract by Conrad Schroeder and Edmund A. Bartl Actual work on the shaft was begun on May 1; on May 20 it had been carried to a depth of 35 feet in the east shaft, and on the 26th of May the west shaft had reached a depth of 37 feet. This was through soft material and it was necessary to use 10x10 timber closely placed. At the depths given rocks were reached and blasting was commenced, although the compressor had not arrived. Both shafts were sunk 15 feet, and on June 1, air was started through 3-inch pipe and on July 20 both shafts were finished, the east one being carried down 60 feet below the cribbing and the west one 54 feet.

The tunnel was started and carried 387½ feet, making a total distance of 500 feet, driven in 48 days. After finishing the rock work the tunnel was lined with brick and concreted between the brick wall and the rock. The shafts were treated in the same way. Throughout the work the hoisting was done with Mundy hoists and stiff leg derricks. With the exception of two light injuries on the hands, nobody was hurt. The superintendent of the drilling and other work was an experienced shaft and timberman, James Judge, who drove a tunnel at Niagara Falls for the paper mill several years ago. Two Ingersoll-Sergeant D drills were used on each side. The compressor, also of Ingersoll-Sergeant make, required little attention and was never out of order. The drills could have been a little larger, but they filled the bill well. About 300,000 bricks and 1,100 yards of concrete were used, which was machine mixed. The work was finished Sept. 14, a few days ahead of contract time. The location of both shafts is only about 50 feet from the Lake Erie shore, but through careful timbering all caves and rush of water were prevented.

Geo. H. Holzbog & Bro., of Jeffersonville, Ind., manufacturers of wagons and buggies, are in the market for the following machinery, either new or second hand in good condition: 1 power hub boring or boxing machine, suitable for light and heavy work; 1 good-sized planer, 1 good-sized mortising machine.

President Thompson and other officers of the Republic Iron & Steel Co., in company with Julian Kennedy, have been in the Birmingham, Ala., district this week, inspecting the company's properties there, particularly the Pioneer plant at Thomas. It is stated that the erection of a steel plant at Thomas is under consideration, as well as a fourth blast furnace. President Thompson made the statement that the need of a steel plant was recognized, but he was not prepared to go into details.

It is stated that two stationary open-hearth furnaces will be added to the plant of the Alabama Steel & Shipbuilding Co. at Ensley, Ala. The purpose, as explained by General Manager McCrery, is to test the relative economy and efficiency of the tilting and stationary types. If this test is favorable to the stationary furnace the 10 tilting furnaces at the Ensley plant will be changed to the stationary design.

Despite reports to the contrary the National Tube Co. is not operating its National Rolling Mill plant at McKeesport, Pa., on Sunday. Heretofore the plant has been closed for a period of 48 hours from Saturday morning until Monday morning. Instead of resuming operations on Monday morning one crew returns to work on Sunday night, reducing the period that the mill is closed from 48 to 36 hours.

The 26 and 18-inch mills of the Bessemer plant of the Republic Iron & Steel Co. at Youngstown, O., will probably be placed in operation about the first of the year. Work on them is progressing rapidly.

PERSONAL.

General Manager James A. Campbell of the Youngstown Iron Sheet & Tube Co., Youngstown, O., last week made three important appointments. L. G. Howard, general manager of the Warren,O., plant of the National Tube Co., was appointed master mechanic of the tube department; John Howells, formerly employed at the lower mill of the American Steel Hoop Co., Youngstown, O., was made assistant to chief engineer Jacob Ferris; Walter Hendry was appointed superintendent of the foundry. He formerly was employed in a similar capacity in the Lloyd-Booth plant of the United Engineering & Foundry Co.

N. M. Peterson, who has been manager of the Columbus, O., plant of the National Steel Co. for a number of years, has been appointed superintendent of the Bellaire and Mingo Junction, O., plants of the same company to succeed A. B. Carter, resigned.

W. A. Majors, formerly purchasing agent of the Sloss-Sheffield Steel & Iron Co., will return to Birmingham, Ala., to assume the duties of purchasing agent for the Tennessee Coal, Iron & Railroad Co., vice W. F. Tyler, who has resigned.

B. F. Jones, Jr., J. B. Laughlin and H. S. Kiehle, of Jones & Laughlins, Ltd., Pittsburg, were on a tour of inspection last week in Minnesota, looking over the ore properties owned by the company. It is denied that additional properties are to be purchased.

Mr. Beaman, of Beaman & Smith, builders of machine tools, Providence, R. I., was in Cleveland last week on a business trip.

W. C. DeArmond, who resigned on July 31 as secretary of the Pressed Steel Car Co., has now severed his connection with the T. N. Motley Co., of New York, as its secretary and treasurer. This is with a view to devoting all his time to the management of the Protectus Co. of Philadelphia.

The British Iron and Steel Delegation.

The three representatives of the British Iron Trade Association, whose mission to the United States was referred to in these columns recently, arrived in New York last week: J. Stephen Jeans, the secretary of the association, who has visited this country on several occasions and has become quite familiar with iron trade conditions here; Ebenezer Parkes, M. P., the president of the association, and Axel Sahlin, manager of the furnaces of the Millom & Askam Co., at Millom, Cumberland, formerly connected with the Maryland Steel Co., and afterward with the Brown Hoisting Machinery Co. On Friday, Oct. 4, the visitors met a committee of the Merchants' Association of New York and were assured of every facility for prosecuting their investigations. The question of transportation will be looked into, particularly the matter of through bills of lading for export. From New York the party went to Buffalo and will visit in turn, Cleveland, Chicago, St. Louis, Cincinnati and Pittsburg, returning to New York by way of Philadelphia.

Mr. Sahlin's department of the work will be investigating and writing a report upon modern blast furnaces and blast furnace practice, handling and transport of materials and other problems connected with the production of pig iron.

The Union Iron & Steel Co., 71 Broadway, New York, has booked an order from the Ashland Steel Co., Ashland, Ky., for a round lot of Bessemer pig iron to be manufactured at the Union Furnace, Ironton, O.

The Minnie Lake Iron Co. of Mellen, Wis., has been incorporated with a capital of $30,000, for the purpose of mining iron ore. The officers of the company are as follows: A. J. Sullivan, president; James Guest, vice-president; L. A. Maier, secretary and treasurer.

Owing to the large amount of business which the American Ingot Mold Co. of America has received of late, the idle plant of Wm. Yagle & Co., Ltd., Pittsburg, was placed in operation this week.

OUR MINERAL OUTPUT IN 1900.

Washington, Oct. 3.—A report just issued by the United States Geological Survey shows that the total value of minerals of all kinds produced in this country in 1900 was $1,070,108,889. The total value of the metallic products was $552,418,627; the non-metallic, $516,690,262; and estimated value of mineral products unspecified $1,000,000. The quantity and value of each is as follows:

Pig iron, 13,789,242 long tons, valued at $259,944,000; silver, 59,600,543 troy ounces, coining value, $77,070,471; gold, 3,837,215 troy ounces, coining value, $79,322,281; copper, 606,117,166 pounds, value at New York City, $98,494,039; lead, 270,824 short tons, value at New York City, $23,561,688; zinc, 123,886 short tons, value at New York City, $10,654,196; quicksilver, 28,317 flasks, value at San Francisco, $1,302,586; aluminum, 5,200,000 pounds, value at Pittsburg, $1,716,000; antimony, 1,750 short tons, value at San Francisco, $346,980; nickel, 9,715 pounds, value at Philadelphia, $3,886; platinum, 400 troy ounces, value (crude) at San Francisco, $2,500; bituminous coal, 212,513,912 short tons, value, $221,133,513; Pennsylvania anthracite, 51,221,353 long tons, value, $85,757,851; natural gas, value, $23,606,463; petroleum, 63,362,704 barrels, value, $75,752,691; brick clay, value, $12,000,000; cement, 17,225,131 barrels, value, $13,279,167; stone, value, $47,958,539; corundum and emery, 4,305 short tons, value, $102,715; garnet (abrasive), value, $123,475; grind-stone, value, $701,121; infusorial earth and tripoli, 3,615 short tons, value, $24,207; millstones, value, $32,858; oilstones, value, $181,011; borax, refined, 1,602 tons, value, $170,036; borax, crude, 24,235 tons, value, $848,215; bromine, 521,444 pounds, value, $140,790; fluorspar, 18,450 short tons value, $94,500; gypsum, 594,462 short tons, value, $1,627,203; marls, 60,000 short tons, value, $30,000; phosphate rock, 1,491,216 long tons,. value $5,359,248; pyrite, 204,615 long tons, value, $749,991; salt, 20,869,342 barrels, value, $6,944,603; sulphur, 3,525 short tons, value, $88,100; barytes, 67,680 short tons, value, $183,089; cobalt oxide, 6,471 pounds, value $11,648; mineral paints, 72,222 short tons, value, $881,363; zinc, white, 48,840 short tons, value, $3,667,210; asbestos, 1,054 short tons, value, $16,310; asphaltum, $68,429 short tons, value, $491,598; bauxite, 23,184 long tons, value, $89,676; chromic iron ore, 140 long tons, value, $1,400; clay (all other than brick) value, $1,840,377; feldspar, 21,363 short tons, value, $173,659; flint, 32,495 short tons, value, $179,351; fullers earth, 9,698 short tons, value, $67,535; graphite, crystalline, 5,507,855 pounds, and amorphous, 611 tons, total graphite value, $197,579; limestone for iron flux, 7,495,435 long tons, value, $4,500,000; magnesite, 2,252 short tons, value, $19,333; manganese ore, 11,771 long tons, value, $100,289; mica, 456,393 pounds of sheet, value, $92,758, and scrap, 5,453 tons, value, $54,302; mineral waters, 47,558,784 gallons sold, value, $6,245,172; monazite, 908,000 pounds, value, $48,805; precious stones, value, $233,170; rutile, 300 pounds, value, $1,300; and soapstone, 27,943 short tons, value, $383,541.

German Customs Decisions on American Imports.

The vigilant German customs officials continue to scrutinize importations very closely, as is shown in a recent report from Mr. Frank H. Mason, Consul General at Berlin. It serves to illustrate what is likely to happen whenever any manufactured article is made of two or more component materials. In fact this change in valuation has happened with articles consisting mainly of iron or steel in combination with a spring or other small piece of brass or bronze. As iron or steel these have been subject to a duty of ten marks ($2.38) per 100 kilograms (220 pounds). In some instances these have been re-rated as brass goods, dutiable at 24 marks ($5.71) per 100 kilograms. Mr. Mason states that it will interest certain exporters of machine-shop appliances from the United States to know that a recent decision of the imperial German customs office reclassifies emery wheels, and doubles the duty hitherto levied on that class of imports. German-made emery wheels are usually manufactured of pure corundum, the hole which is pierced through the center of the disk fitting round the shaft as a result of disintegration from vibration. To prevent this, American manufacturers of emery wheels are accustomed to line, or "bush," the central orifice with Babbitt metal, or some other alloy that will give a firm seat to the shaft. Hitherto, these "bushings" have been generally covered with a label bearing the name of the maker, size, number, etc., and the metallic portion thereby concealed. Recently, however, this has been discovered, with the result that emery wheels so provided with bushings are classified for duty as metal in combination with corundum (Schmirgel), which increases the rate from 3 marks to 6 marks ($1.42) per 100 kilograms. This rate will not seriously affect the trade in the smaller sizes of wheels, but as they are made and used in all diameters up to 3 feet, the increased duty will have a tangible effect on the net cost of the larger sizes.

TRADE PUBLICATIONS.

The Kempsmith Manufacturing Co., Milwaukee, Wis., has published a 6x9, standard size, catalogue of milling machines that is an exceptionally creditable piece of work even in these days of artistic letter press. The half-tones are beautifully finished and nothing has been omitted that would enhance the quality of the production. A general line of plain and universal millers are shown in detail with complete specifications. There are also illustrated attachments for angular, circular and high speed milling; cutting racks and vises for the same; vertical and taper milling. A centering machine is also listed with illustrated description. The firm not only manufactures arbors, vises, centers, etc., but is prepared to receive specifications for milling machines varying in any respect to those catalogued.

Baker & Co., Newark, N. J., refiners of platinum, have issued a 12-page pamphlet entitled "The Alchemistic Symbols." It contains a brief acount of the origin and meaning of the quaint abbreviations devised by the predecessors of our modern chemists. The article has been prepared by James L. Howe of Washington and Lee University.

The catalogue of the L. H. Solosth & Sons' Stamping Works, Grand Rapids, Mich., is 9x12 and covers 112 pages. It is freely illustrated with cuts of the extensive line of sheet metal work produced at this establishment; steel ceilings, statuary and stove boards, metal spinning, stamping and presswork in great variety. Blue flame oil stove cookers and heaters are also manufactured.

The Western Malleable & Grey Iron Mfg. Co., Milwaukee, Wis., has a new catalogue devoted to the perfection chair and stool irons. The catalogue fully illustrates tilting, adjusting and locking devices in the many varieties listed by this company. The firm also manufactures a complete stock of truck wheels, axles and castors, etc.

The Charles Munson Belting Co., Chicago, has a 7¾x5⅜, 112-page catalogue, largely devoted to belting, but considerable attention is given to belt punches and other tools, pulleys, clamps, packing, shafting, lubricants and lubricators, etc. Some very useful information is given in regard to the manufacture and application of belting.

A small catalogue, No. 5, is being sent to the trade by the E. W. Bliss Co., Brooklyn. The pamphlet treats of drawing presses and spinning lathes.

The Adams Co., Dubuque, Ia., is building a new machine shop, 75x120 feet, also a boiler room and pump room.

The Marinette Iron Works, Marinette, Wis., is building a gas producer plant of 200-h. p., to enable it to operate its plant with its own engines on producer gas.

The Atlas Engine Works, Indianapolis, Ind., have just completed a new boiler shop, composed of two wings, 72 feet in width, one running 900 feet and the other 365 feet, with an independent power house attached. The company reports that it has also just got under roof a new foundry, 65x300 feet, and has partly finished another, 120x500 feet. All these buildings are one-story, brick and stone. Contracts have been let for a new machine shop, three stories high, 50x323 feet, and preparations are being made for the construction of a central power house which will provide power for running the entire plant by electrical transmission. It is also the intention to erect a central melting plant in the near future.

The Lodge & Shipley Manufacturing Methods.

The Lodge & Shipley Machine Tool Co., Cincinnati, has set out to do one thing—the building of the tool that, of all others, holds undisputed sway in the machine shop A lathe demands fully as high a grade of workmanship as anything else about the shop; it is only limited in that respect by the amount the prospective purchaser is willing to give for the completed tool. Competition has narrowed matters to such a limited scope that the lathe manufacturer, in order to pay wages equal to those of other builders of machine tools, must produce high grade goods on at least an equally elevated standard of economical management. It is this last particular with which the writer is at present most concerned, and on a recent visit to Cincinnati the Lodge & Shipley shops were seen and some inquiries made concerning the manufacturing procedure.

The Taylor-White process of hardening tools is in use in these shops and was endorsed heartily by Mr. Lodge as a valuable adjunct in high pressure practice. The process has been already dealt with in *The Iron Trade Review* at some length and but recently, Sept. 12, a paper by Mr. Day, of the Link-Belt Engineering Co., Philadelphia, went very thoroughly into the general subject of the trend of modern methods and the impetus given by the Taylor-White or other similar process to the rate of production by an effective means for profitably changing the breaking down point of cutting tools. The efficiency of a tool is the measure of its capacity to cut profitably a maximum amount of material; and to do this successfully the cutting edge must be maintained and keep pace with the increased production. The speed must be carefully adjusted to a rate that will permit the tools to slice off their proper quota, with no added loss in the time taken to grind up the cutting edges. In order to fulfil these conditions the Lodge & Shipley tools are kept for particular and specified purposes only. Shafts are roughed down in lathes that are not employed for finishing cuts and the machine tools are arranged in classes with regard to their especial field of usefulness. By this means and the adoption of suitable transmission devices the work is handled in an orderly and thoroughly effective style.

I notice on some of the lathes an adaptation of a scheme seen on an old English lathe, the back rest being in two parts instead of three, and concaved out to fit the shaft. This plan calls for an additional set for every size of shaft, but where the work is uniform that is no detriment whatever to the benefits derivable from this method of steadying the work. The supporting frames or brackets may be made uniform and the bearings interchangeable for a number of lathes.

There is a plan common enough in shops building textile machinery, of supplying the workmen with sample pieces from which the sizes of the work under way are obtained and the measurements are thus easily transferred from the old to the new with little possibility of error. This method does not so frequently obtain in the shop devoted to machine tools because of the more general use of the micrometer caliper and the ever-present blue-print. But in many cases where there is a succession of repetitive processes, as necessarily follow from the building of a single type of machine, there are manifest advantages in sending out the samples to indicate finish, and in a limited way to act as a check upon the character of the work and its closeness to the standard requirements. These samples, which are mainly in use around the screw machines,

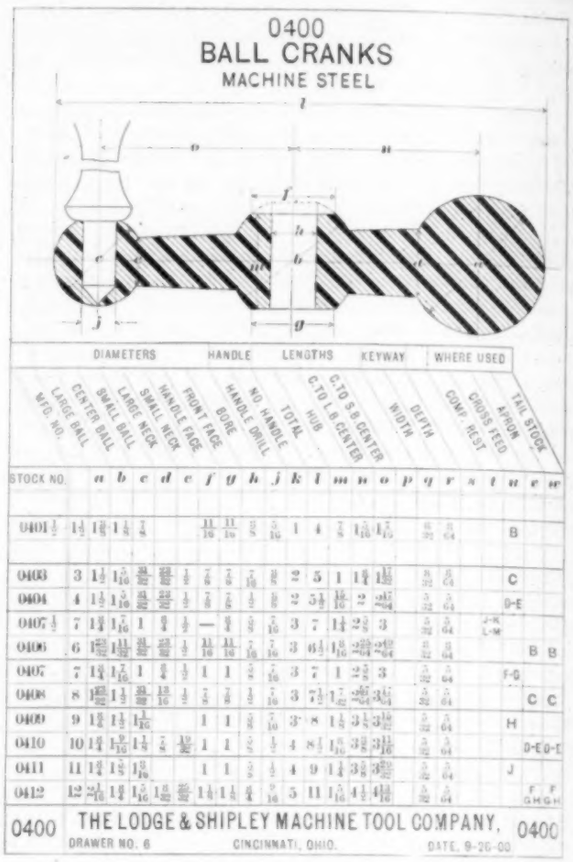

FIG. 1.—SHOP REFERENCE BOOK.

MATERIAL ISSUED FROM STORES

SYMBOL	DESCRIPTION OF MATERIAL	DATE	QUANTITY		AMOUNT
G 967	Head Spindle	8-26	3600	3	108 00

Remarks: 67 hrs @ 15¢ hourly Burden $10.05

Material	108 00
Wages	13 85
Prime Cost	$ 121 85
Burden	10 05
	$ 131 90

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FIG. 2.—ORDER FROM DRAWING OFFICE TO STOCK CLERK.

are carefully handled and as far as possible the newness of the pieces is guarded against injury while in use. The sample not only acts as a reference gauge for the various sizes, but has also a constant influence toward that better discipline of the eye and hand of the workman that is necessary in the continuance of a uniform output.

Handling of Shop Blue Prints.

The reference blue-prints for machine shop use are not thrown around the benches or on the beds of tools, nor are they mounted on cardboard or rolled in tubes. In the first place, the shop blue-prints are made to a definite size, 18x12 inches, and on tabular work have blue lines on a white ground instead of the familiar white lines on a blue ground. The attempt is made to have the sheets complete for the class of work they are intended to cover, as, for example, the table giving the screws, nuts, pins, keys, springs and washers for the lathe apron does this for every size of lathe from *B* to *M* (14-inch to 48-inch lathes). The items are arranged in classes by heavy horizontal and vertical lines, and provision is made to give the three particulars for each piece without confusion. For instance, the line which bears on its extreme left the legend "Screw for half nut lock" passes horizontally through the several classes indicative of the lathe sizes, and under the symbol letter, or the swing in inches, one may readily read the necessary details. Under J-30-inch would appear for the detail I have selected for illustration: 64 (the No. of the part), $\frac{3}{8}$x$\frac{3}{4}$ (the size) and 1 (indicating the number required). The reference blue-prints are fastened down on sheets of zinc, leaving a clear metal margin of half an inch around the edge of the print for handling. The zinc sheet has a projection at an upper and a lower corner at the side and by means of a couple of binder bearings or brackets a number of these zinc reinforced prints are attached to a convenient post or wall in book form. Over the book is a blue-printed index, covering the subject matter of the various sheets, and a glance at this 3 by 4 card supplies the cue even to a complete stranger who may be making his initial effort to gather up the threads of the shop routine. This systematic arrangement is not only convenient, but renders the prints capable of a far longer existence than in shops where the sheets are carelessly folded and thrown on the machine with an occasional trip to a floor that in the nature of things must present a more or less grimy surface.

Shop Reference Books.

In addition to the blue-printed reference sheets already described, there are several bound books in the shop containing blue-printed sheets of lathe data in handy form for the use of foremen and others. These books are composed of 6x9 standard sheets, and as in the larger tabular forms, the information is condensed and classified. The smaller sheets have, however, the addition of a reference drawing as may be seen in Fig 1, which is taken from the "Apron" book. It will be noted that the class number is repeated at the two lower corners and the top of the sheet, and that the stock number is the addition of the class number to the manufacturing number. The dimensions are grouped together, as will be understood by an examination of the double classification at the head of the table. Immediately below the title is the material and a plain sketch of the piece.

The shop orders are received from the drawing office and by way of introduction to the forms which are here reproduced, it is well to point out that no attempt has been made to copy the figures from any actual account kept by the Lodge & Shipley Machine Tool Co. The figures, rate, time, cost, etc., are merely introduced as illustrative of the system and have no further foundation in fact. Fig. 2 and Fig. 3 are on one sheet—on opposite sides, of course. The lower part of each sheet is filled out in the office afterwards from the time cards, etc., as the work progresses. Upon the receipt of this order for material from the drawing office, the stock clerk first notes whether he has in stock the full quantity of material demanded on the reverse side of the order blank, namely, on the upper part of Fig. 3. Here is the lot order number, the description and shop number, the number of pieces required, as well as the symbol giving the key to the sizes, etc. If all the material is on hand, the stock clerk fills out and attaches a tag to one of the pieces in the lot. The tag properly filled out for this order is shown in Fig. 4, and this tag is attached to the material in its journey through the shop.

LOT ORDER No. 967 — Head Spindle

Shop No. 443 Pcs. 24 Sym. G

OPERATIONS	WORKMEN'S NAMES	No.	TIME	TOTAL HOURS	RATE	AMOUNT
Lathe	Tom Smith	15	5 10 8 6	29	25	7.25
Milling	J. Jones	28	3 7	10	10	1.00
Grinding	J. Clancy	32	10 7 8 3	28	20	5.60

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FIG. 3.—REVERSE SIDE OF FIG 2.

FIG 4.—STOCK TAG.

The order is then sent to the general foreman at once. Should there not be sufficient stock on hand the stock clerk immediately makes a requisition for such material as may be

TIME-CARD.

No. 15 Shop No. 443

Name Symbol

Date 8-26 Piece Work No. 967

Turning 5 Hrs. Grind. and Pol. Hrs.

Drilling " Assembling "

Planing " Painting "

Milling "

Amount $

Use separate slip for each Order Number and for each class of Work. Fill out daily. THE IRON TRADE REVIEW

FIG 5.—PRODUCTIVE TIME CARD.

required to complete the lot and holds the order until the necessary quantity is delivered to him. When the order reaches the general foreman it is pigeon-holed according to the class of tool by which the first operation is to be performed,

TIME-CARD.

No._____ Order_____

Date_____ Name_____

Supervising	Hrs.	Gigs	Hrs.
Draw. and Pat.	"	Machinery Repairs	"
Shop Work	"	Defective Work	"
Shipping Room	"	Repair Orders	"

Amount

Use separate slip for each Order Number and for each class of Work. Fill out daily. THE IRON TRADE REVIEW

FIG. 6.—NON-PRODUCTIVE TIME CARD.

and is retained by the foreman until such time as he chooses to assign the work; then the order is handed to a laborer with instructions to present it to the stock clerk and afterwards deliver such material as he shall receive from that department to the workman to whom the work has been assigned. The stock clerk is strictly forbidden to give out any material other than that demanded by one of these blanks or a stock withdrawal form, countersigned by the foreman; either of these forms, as may be required, are properly entered as to weight of material, etc., and are then sent immediately to the cost clerk in the office whenever anything is removed from the stores. In order to save space the order forms have been reduced as is shown by the broken line at the bottom of Fig. 3. The full size of this form and of Fig. 2 is 5¼x8 inches.

The instructions on the back of the tag, Fig. 4, are so complete as well as suggestive that they are here reproduced:

NOTICE TO WORKMEN.

"No work must be done on this job without the authority of the foreman. Should the work be assigned to you, first count the pieces and see if the number agrees with the quantity called for on the other side of this tag. The lot must not be broken under any circumstances, hence you will be held responsible for any shortage that may occur from the time you accept the work from the last operator until such time as it shall be allotted to and accepted by the next operator. In order to avoid unnecessary delay in getting work from stores you are expected to notify your foreman a half hour before the completion of each operation upon which you are engaged. The time of going off one job and on to the next must in all cases be identical, so time will continue to be debited to your last order until the time clerk is informed through your foreman of the exact time that the last job was completed.

"You are therefore expected to do three things on being assigned each new job:

"1st. Count the pieces before accepting the work.

"2d. Report to your foreman a half-hour before finishing the work.

"3d. Notify your foreman of the exact time when you complete the work.

"This tag must not be detached until the work is collected for the purpose of assembling, when it should be sent immediately to the time clerk.

"These instructions are imperative."

Productive and Non-Productive Time Cards.

The shop time cards are divided into two classes, productive and non-productive. These are shown in Figs. 5 and 6, and are 3¾x6 inches in size. The productive time card is white and the non-productive card green. On one of these the workman has inserted his number in lieu of the name. The productive card will be plainly understood from the engraving. The non-productive card is handled in an exactly similar way and covers the time spent in supervision of the work, drawings and patterns, work on shop tools and equipment, boxing, crating and other shipping expenses, new jigs or repairs to the same, replacing defective work and repair orders.

TIME-SHEET.

Name of Workman Tom Smith Check No. 15

ORDINARY TIME										OVERTIME										REMARKS
Shop Order Number	Mon.	Tues.	Wed.	Thu.	Fri.	Sat.	TOTAL	Rate	Amount debited to job	Shop Order Number	Mon.	Tues.	Wed.	Thu.	Fri.	Sat.	TOTAL	Rate	Amount debited to job	
443	5	10	8	6			29	25	7 25											
493	3			4			7		1 75											
372	2		2		7		11		2 75											
439					3	3	6		1 50											
692						7	7		1 75											
TOTALS	10	10	10	10	10	10	60	25	15 00	TOTALS										

Week Ending Aug 30, 1901 Week Ending 190

Examined F. C. Timekeeper Examined Timekeeper

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FIG. 7.—WORKMAN'S TIME SHEET.

Sym. 967 Size 24 NAME Head Spindle

Weight 150

Lot No.	No. Pieces	Turning	Drilling	Planing	Milling	Grinding	Polishing	Cost
36	24							
443	3600	29 5 80			10 60	28 7 50		13 90

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FIG. 8.—CARD INDEX SYSTEM.

The contents of the cards are tabulated on the time sheets, Fig. 7. These are in the original 9¼x8¾ inches and of course in book form, the hourly rate being given with the amounts debited to the work. It will be seen that separate provision is

made for the tabulation of overtime, but the need of an additional classification to cover the entire week, duplicating the time sheet, has not proved essential and it is likely that this table, when another supply is ordered, will be arranged to read for regular time and any overtime will be handled by a change in the hourly rate.

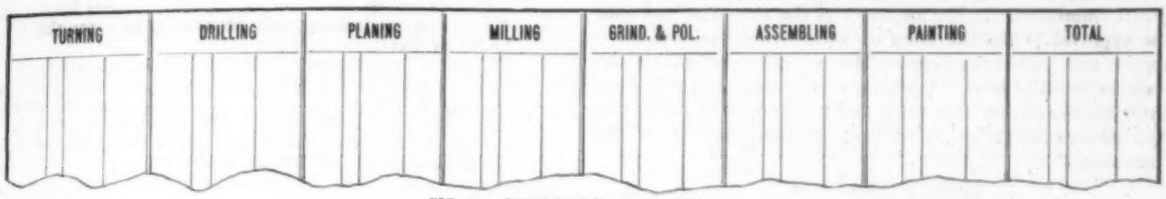


FIG. 9.—PRODUCTIVE COST SHEET.

There is a card system maintained in connection with the work which is shown in Fig. 8. The units of this index are 3¾x6 inches in the original, and detail in concise form the time, labor, costs and weight. The name of the piece is given, the individual and collective weights, the size of the lathe, etc.

The general productive and non-productive cost sheets are shown in Figs. 9 and 10. After these items of expenditure have been gathered, the original order, Figs. 2 and 3, may be completed, as shown at the bottom of the former, and the shop history of the head spindle is then at hand from drawing office to shipping clerk. The productive and the non-productive cost sheets, Figs. 9 and 10, are 6x9½ inches.

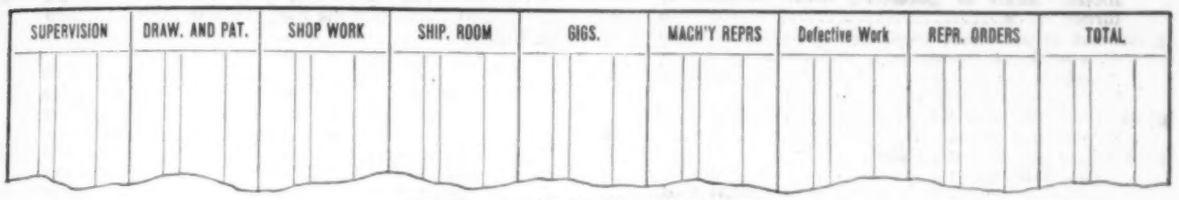


FIG. 10.—NON-PRODUCTIVE COST SHEET.

A Flexible Grinding Rig.

There is a very useful device in that part of the plant which is used for the reception of castings as they come in from the foundry. The castings have already been snagged and to the usual extent they are ready for the machinist. There are many parts of a large casting that are not so easily manipulated against the surface of an emery wheel as would be the case with a lighter piece. Realizing, therefore, the difficulty of handling a heavy lathe bed on an abrasive machine the wheel has been carried to the casting. This flexible grinding rig is illustrated in Fig. 11. A is a trolley with the four wheels resting on the bottom flange of a steel beam supported by arms attached to the uprights. A tee and a hook B sustain the enclosed motor D by a rod E and a stirrup F. A flexible shaft J is equipped with an abrasive wheel K and connected to the motor by the universal joint G. The flexible shaft is supported by the bracket H and the stout cords LL. The rod C passes easily through an opening in B and is counterbalanced by a weight at the opposite end to the cords LL. By means of the flexible shaft, the overhead trolley and a cable containing the lead wires to the suspended motor, the wheel K can be carried entirely around a casting and applied with freedom and ease. The large flat surfaces on the heavy castings are also worked over with expedition and the general convenience of the scheme results in work being done that would under usual conditions simply fail to get the needed treatment.

R. I. C.

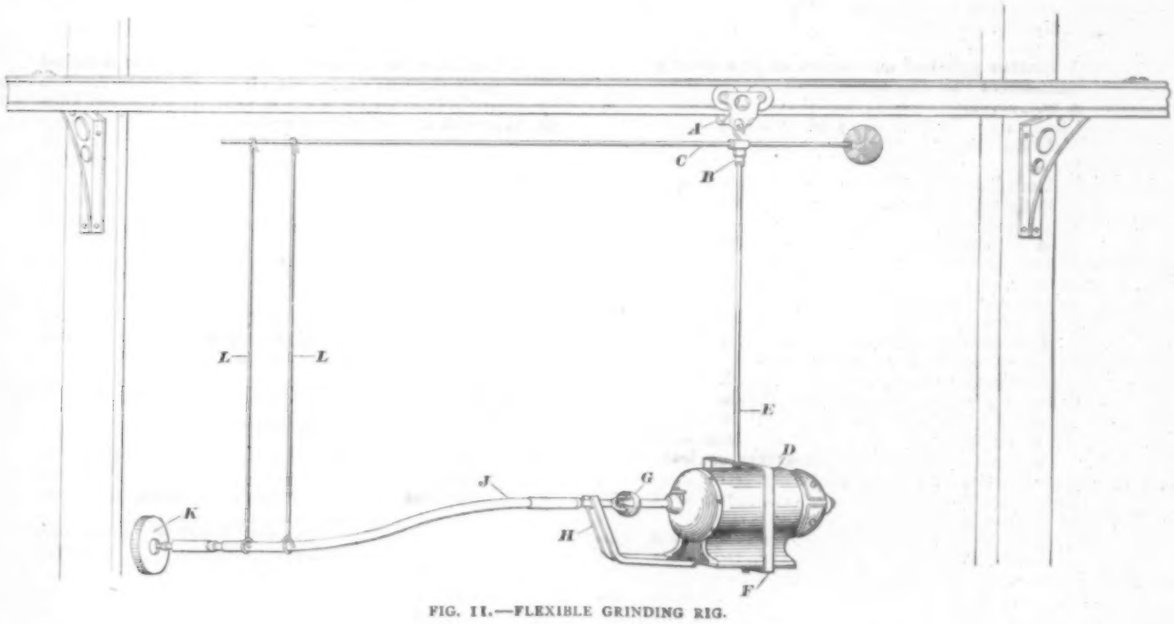


FIG. 11.—FLEXIBLE GRINDING RIG.

The Wilkins-Leonard Hardware Co. of Youngstown, O., has been incorporated with a capital of $50,000. The incorporators are C. F. Wilkins, W. R. Leonard, S. B. Clegg, George Tod, Jr., Charles Crandall, E. R. Thompson and J. B. Kennedy.

The third furnace of the Dominion Iron & Steel Co., at Sydney, Cape Breton, is about ready to blow in. The output of the company in a recent week aggregated 3,887 tons of iron, a daily average of 555 tons from two furnaces.

PHILIPPINE TARIFF ON IRON AND STEEL.

Washington, Oct. 7.—The War Department, Division of Insular Affairs, has just published the revised customs tariff for the Philippine archipelago. It is an enactment of the Philippine Commission, "by the authority of the President and with the approval of the Secretary of War." The iron and steel, copper and other metal schedules are given below, all the weights being in kilos. A kilogram is equal to 2.2046 pounds avoirdupois and 100 kilos equal 2204.6 pounds or a metric ton. The abbreviation "g. w." is for "gross weight," and "n. w." for "net weight":

Group 2.—Cast Iron.

Articles of malleable cast iron are dutiable as manufactures of wrought iron.

30. Pigs, g. w. ..... 100 kilos $ .10
31. Articles not coated or ornamented with another metal or porcelain, neither polished nor turned:
    (*a*) Bars, beams, plates, grates for furnaces, columns and pipes, g. w. ..... 100 kilos .35
    (*b*) Lubricating boxes for railway trucks and carriages, and railway chairs, g. w. .. 100 kilos .30
    (*c*) Articles, other, not elsewhere mentioned, g. w. ..... 100 kilos .75
32. Articles of all kinds not coated or ornamented with another metal or porcelain, either polished or turned, n. w. ..... 100 kilos 1.20
33. Articles of all kinds, enameled, bronze gilt, tinned or coated, or ornamented with other metals or porcelain, n. w. ..... 100 kilos 2.00

GROUP 3.—WROUGHT IRON AND STEEL.

34. Iron, soft or wrought, in ingots or "tochos," steel in ingots, g. w. ..... 100 kilos .24
35. Wrought iron or steel, rolled:
    (*a*) Rails, g. w. ..... 100 kilos .30
    (*b*) Bars and beams, neither perforated, riveted, with screws, nor cut to measure, of all kinds (excepting fine crucible steel) including rods, tires, and hoops, g. w. ..... 100 kilos .60
    The rods in question are iron or steel rods exceeding eight millimeters in thickness, employed in the manufacture of iron wire.
    (*c*) The same, of crucible steel, g. w. .. 100 kilos 1.05
    Crucible steel is distinguishable from bar and other pieces of iron or common steel by its sharp edges. The surface is very smooth, of a bluish color darker than that of iron and its fracture is close grained. (This steel is generally imported in round, triangular, square, octagonal or flat bars.)
36. Wrought iron and steel sheets, rolled:
    (*a*) Neither polished nor tinned of 3 millimeters and more in thickness, g. w. ..... 100 kilos .78
    (*b*) Neither polished nor tinned of less than 3 millimeters in thickness, and hoop iron, g. w. ..... 100 kilos .78
    By hoop iron (fleges) shall be understood unpolished, flat bands or circles less than 3 mm. in thickness.
    (*c*) Tinned and tin plate, g. w. ..... 100 kilos 1.00
    (*d*) Polished, corrugated, perforated, cold rolled, galvanized, or not, and bands of polished hoop iron, g. w. ..... 100 kilos .90
37. Wrought iron or steel:
    Cast in pieces in the rough, neither polished, turned, nor adjusted, weighing each—
    (*a*) 25 kilos or more, g. w. ..... 100 kilos .75
    (*b*) Less than 25 kilos, g. w. ..... 100 kilos 1.00
38. Wrought iron or steel cast in pieces, finished:
    (*a*) Wheels weighing more than 100 kilograms, fish-plates, chairs, sleepers, and straight axles; springs for railways and tramways; lubricating boxes, g. w. ..... 100 kilos .45
    (*b*) Wheels weighing 100 kilograms or less; springs other than for railways and tramways; bent axles and cranks, g. w. ..... 100 kilos 1.05
39. Wrought iron or steel pipes:
    (*a*) Covered with sheet brass, g. w. .. 100 kilos 1.40
    (*b*) Other, galvanized or not, g. w. .. 100 kilos 1.05
40. Wrought iron or steel wire, galvanized or not:
    (*a*) 2 mm. or more in diameter, n. w. .. 100 kilos .75
    (*b*) More than half and less than 2 mm. in diameter, n. w. ..... 100 kilos 1.00
    (*c*) ½ mm. or less in diameter and wire covered with a textile, n. w. ..... 100 kilos 1.40
41. Wrought iron or steel in large pieces, composed of bars or bars and sheets fastened by means of rivets or screws; the same, unriveted, perforated, or cut to measure for bridges, frames and other buildings, g. w. ..... 100 kilos 1.00
42. Anchors, iron or steel plates for vessels, chains for vessels or machines, moorings, switches, and signal disks, g. w. ..... 100 kilos .50
43. Anvils, g. w. ..... 100 kilos 1.75
44. Wire gauze:
    (*a*) Up to 40 threads per square inch, n. w., 100 kilos 1.75
    (*b*) Of 40 threads or more per square inch, n. w. ..... kilo .04
45. Cables, fencing (barbed wire), netting; furniture springs, n. w. ..... 100 kilos .75
46. Tools and implements, not apparatus, or wrought iron or steel:
    (*a*) Fine, for arts, trades and professions, partly or wholly of crucible steel, n. w. .... 100 kilos 5.00
    (*b*) Other, n. w. ..... 100 kilos 1.50
    Provided, that none of the articles classified under this paragraph shall pay a less rate of duty than 15 per cent ad valorem.
47. Screws, nuts, bolts, washers, and rivets, n. w., 100 kilos 2.00
48. Nails, clasp nails, tacks and brads, n. w. .... 100 kilos 1.00
49. Saddlery hardware:
    (*a*) Common, made of iron or steel, common bits, spurs, and all finishes of common harness, not nickeled or covered with other metals or materials, n. w. ..... 100 kilos 3.00
    (*b*) The same ornamented, nickeled or covered with other materials, n. w. ..... 100 kilos 6.00
50. Buckles, not gold or silver plated:
    (*a*) Bronze gilt, silvered or nickeled, n. w. kilo .20
    (*b*) Others, n. w. ..... kilo .15
51. Sewing and embroidering needles, pens, n. w. .. kilo .30
52. Common pins, hooks and eyes, n. w. ..... kilo .30
53. Crochet hooks and the like, hairpins, n. w. ..... kilo .30
54. Cutlery:
    (*a*) Butchers', shoemakers', saddlers', kitchen, bread, vegetable, cheese, plumbers', and painters' knives with wood handles, table knives and forks, with wood handles, scissors and shears, with glazed or japanned bows, n. w. ..... kilo .15
    (*b*) Pocket cutlery, side arms (not fire), and parts for the foregoing; razors, n. w. .... kilo .60
    (*c*) Pruning and budding knives, grass, garden, hedge, pruning and sheep shears, n. w. .... kilo .05
    (*d*) Surgical and dental instruments, fishing hooks, and all other cutlery, including scissors, and shears not otherwise provided for, n. w. ..... kilo .30
    Provided that none of the articles classified under paragraphs 51, 52, 53, and 54 shall pay a less rate of duty than 15 per cent ad valorem.
55. Small arms and barrels:
    (*a*) Barrels unfinished, for portable arms, n. w. ..... kilo .25
    (*b*) Barrels, finished, for portable arms, n. w. ..... kilo .60
    (*c*) Pistols and revolvers, also their detached parts, except barrels, n. w. ..... kilo 3.00
56. Other arms, breach and muzzle loading, and detached parts thereof, except barrels, n. w. ..... kilo 2.00
57. Manufactures of tin plate, n. w. ..... 100 kilos 5.00
58. Wrought iron or steel in common articles of all kinds not specially mentioned, though coated with lead, tin, or zinc, or painted or varnished, n. w. 100 kilos 2.50
59. Wrought iron or steel in articles of all kinds not specially mentioned, fine, i. e., polished, enameled, coated with porcelain, nickel, or other metals (with the exception of lead, tin, zinc, gold or silver), or with ornaments, borders, or parts of other metals (except gold or silver), or combined with glass or earthenware, n. w. ..... 100 kilos 4.00
    Provided, that none of the articles classified under this paragraph shall pay a less rate of duty than 15 per cent ad valorem.

Group 4.—Copper Alloys of Common Metals with Copper, Brass, Bronze, Etc.

60. Copper scales (*laminae*) copper of first fusion, old copper, brass, etc., g. w. ..... 100 kilos 1.50
61. Copper and alloys of copper; in ingots, g. w., 100 kilos 2.00
62. The same rolled in bars of all kinds, g. w. 100 kilos 2.25
63. The same rolled in sheets, g. w. ..... 100 kilos 2.50
64. The same in wire, galvanized or not:
    (*a*) 1 mm. or more in diameter, n. w., 100 kilos 4.50
    (*b*) Less than 1 mm. in diameter, n. w. 100 kilos 4.50
    (*c*) Silvered or nickeled, n. w. ..... kilo .35
65. The same in wire, covered with textiles, not elsewhere provided for, or with insulating materials, cables for conducting electricity over public thoroughfares, n. w. ..... 100 kilos 5.00
66. The same in wire gauze:
    (*a*) Up to 200 threads per inch, n. w. ..... kilo .04
    (*b*) Of 200 threads or more per inch, n. w. . kilo .10
67. The same in pipes, bearings, plates for fireplaces, and boiler-makers' wares, partially wrought, g. w., 100 kilos 3.25

68. The same in nails and tacks, crochet hooks, pins, pens and hairpins:
(a) Nails and tacks, bronze gilt, or nickeled, n. w. ..... kilo .20
(b) Nails and tacks, other, n. w. ..... kilo .05
(c) Pins, pens, crochet hooks, hairpins, n. w. ..... kilo .30

69. Copper and alloys of copper:
(a) In articles not specially mentioned, varnished or not, n. w. ..... kilo .15
(b) In articles of bronze gilt or nickeled, not specially mentioned, except when exclusively used for sanitary constructions, n. w. ..... kilo .50
(c) In articles of bronze gilt or nickeled, when exclusively used for sanitary constructions, n. w. ..... kilo .20

By "sanitary constructions" are meant the fixtures, fittings and attachments such as pipes, valves, drains, spigots, basins, faucets, and douches, used in modern sanitary house-plumbing and for bath rooms.

Provided, that none of the articles classified under this paragraph shall pay a less rate of duty than 15 per cent ad valorem.

Group 5.—Other Metals and Their Alloys.

70. Mercury, g. w. ..... kilo .10
71. Nickel, aluminum and their alloys:
(a) In lumps or ingots, g. w. ..... 100 kilos 4.00
(b) In bars, sheets, pipes and wire, n. w. 100 kilos 6.00
(c) In other articles of all kinds, n. w. ..... kilo .10
72. Tin and alloys thereof:
(a) In lumps or ingots, g. w. ..... 100 kilos 2.00
(b) In bars, sheets, pipes and wire, n.w. 100 kilos 3.50
(c) Hammered in thin leaves (tin foil) and capsules for bottles, n. w. ..... kilo .05
(d) In other articles of all kinds, n. w. ..... kilo .50
73. Zinc, lead and other metals, not specially mentioned, as well as their alloys:
(a) In lumps or ingots, g. w. ..... 100 kilos .50
(b) In bars, sheets, pipes and wire, including shot, g. w. ..... 100 kilos .75
(c) Articles bronze gilt or nickeled, except when exclusively used for sanitary construction, n. w. ..... kilo .50
(d) Articles bronze gilt or nickeled, when used exclusively for sanitary construction, n.w. kilo .20
(e) Zinc nails and tacks, neither bronze gilt nor nickeled, n. w. ..... kilo .06
(f) In other articles, including type, n. w. ..... kilo .15

Provided, that none of the articles classified under this paragraph shall pay a less rate of duty than 15 per cent ad valorem.

Group 6.—Wastes and Scoriae.

74. Filings, shavings, cuttings of iron or steel, and other wastes of cast iron or from the manufacture of common metals, fit only for resmelting, g. w. ..... 100 kilos .15
75. Scoriae resulting from the smelting of ores, g. w. ..... 100 kilos .03

Hardness of American and of European Cast Iron.

It is quite generally believed, not only in Europe, but here as well, that the British and Continental cast iron is generally very much harder to work than that which is found in American machine shops. We do not know just how much truth there may have been in this ir the past, nor how much there may be in it now, but it is at least interesting to know the experience of a young man who has had considerable shop experience in America and has been abroad the past two years introducing and demonstrating the workings of a certain well-known American machine tool that works cast iron principally He declares that all over Europe he has worked cast iron and has found it to be not a whit more difficult to work than that which he has worked in America; that the machine works it just about the same as it is accustomed to work American cast iron, with about the same kind of tools, ground and handled in the same way.

This leads us to think that perhaps the belief that European cast iron is harder than that to be found here is based upon facts which have perhaps ceased to exist and it might be well for those who still think that our American cast iron is necessarily and always softer than other irons to investigate the matter little and find out whether it is really so or not. —[American Machinist.

A WASTE HEAT AUXILIARY ENGINE.

The Consul General at Berlin, Mr. Frank H. Mason, gave some account in April, 1900, of a series of experiments which had been made at the Royal Technical High School, in Charlottenburg, with an auxiliary motor designed to increase the efficiency of stationary steam engines by utilizing the heat which goes to waste in the exhaust of a high-pressure, or in the circulating water of a low-pressure, or condensing, steam engine. As the result of these trials was to demonstrate a marked degree of economy in the generation of power, preparations were made to continue the work by Professor Josse and a waste-heat engine has been built and put into service at the central station of the Berlin Electrical Works. The report, recently sent to this country by Mr. Mason, states concisely the results of the daily tests during the three months operation and the resulting status of the waste-heat engine as an economic factor in the generation of power.

In is well known that a large proportion of the thermal energy delivered to a steam engine from its boiler is lost in the unused steam which exhausts into the air of a noncondensing engine or is absorbed by the cold water of the condenser in a low-pressure machine. Compound engines of modern improved types economize this waste power to an important degree by using the steam successively in a second, third, and even fourth cylinder, but even then there remains a dead loss of about 80° of heat, namely, the difference between the temperature of the condenser (140° F.) and that of the circulating water, which will average about 60° F. The idea of the present invention, as described in the previous report above cited, is to utilize this wasted heat for evaporating a liquid which boils, and therefore volatilizes, at a much lower temperature than water. Two of such liquids—ammonia and sulphur dioxide (SO_2)—have been successfully used in the refrigerating industry. For the reasons that sulphur dioxide has a viscous consistency and does not attack, but, on the contrary, lubricates, iron, and because the pressure of its vapors at the temperature of waste steam is readily controlled, it has been used from the first as the best material for this purpose. At 140° F., which is the temperature of steam in a maximum or 80 per cent vacuum, sulphur dioxide vapor has a pressure of 156½ pounds per square inch, while at 60° F., the mean temperature of the cooling water in the condenser, the pressure is about 41 pounds per square inch. There is therefore a range of 80° F., throughout which the exhaust steam from a steam engine will evaporate sulphur dioxide with such energy that its vapor will exert a ready and potent expansive force. The conservation of this expansive force as a mechanical motive power is the function of the "waste-heat," or, as it is otherwise called, the "cold-steam," engine. For this purpose, an additional or auxiliary single-cylinder engine is placed adjacent to the steam engine and geared either to the same driving shaft or run independently with its own driving shaft and fly wheel. The sulphur dioxide is evaporated by the exhaust steam heat in a special type of boiler called the "atomizer." The vapor thus generated passes through the cylinder, and, its effective work being done, it escapes into the SO_2 condenser, where it is condensed to liquid form and pumped back into the vaporizer, thus forming a cycle and being used over and over again indefinitely, as has been fully described in the previous report, which described the experiments down to the close of 1899.

We come now to the subsequent operations. Although the process is technically direct and simple, it was found to involve in practice several new mechanical difficulties. As sulphur dioxide gas is deleterious to the lungs, it was necessary to make all joints and packing—particularly that of the valve and piston rods—so perfect that however great the pressure, none of the dioxide gas or liquid should escape. In the presence of air or water, the neutral dioxide rapidly oxidizes into sulphuric acid (H_2SO_3), which attacks iron and other metals. It is therefore necessary that the whole apparatus shall be air and water tight, and this, to resist an internal pressure of 150 pounds per square inch, requires good materials, first-class workmanship, and intelligent supervision when in operation. The surface condenser, which is required to transmit great quantities of heat energy with a minimum loss of temperature, also required some special adaptation to the treatment of sul-

phur dioxide vapor. All these difficulties, as revealed by the experiments in 1899, were carefully provided for in the new plant.

This was a cold-vapor cylinder of 10½-inch bore and 19½-inch stroke, which was attached to a 150-h. p. triple expansion Görlitz engine of high efficiency, which is regularly employed at the Technical High School for electric lighting and experimental purposes. The engine is of an improved modern type, the high and intermediate pressure cylinders being placed tandem and horizontal, while the low-pressure cylinder is vertical, and all three act upon the same crank and driving shaft.

The cold-vapor cylinder is made of cast iron covered, not with a heating jacket, but with a simple sheet-iron casing packed with felt. It is proportioned for a maximum working pressure of 215 pounds per square inch.

The vaporizer and condenser are of iron, cylindrical in form, and about 10 feet in length. They are set in a steel frame, one above the other, and the pump which injects the liquid dioxide coming from the condenser up into the vaporizer is shown underneath the condenser. Both contain a system of tubes very carefully made and fitted, so as to prevent the leakage of water or dioxide. The vaporizer, which fulfills the function of a cold-steam boiler, is of 34⅝ inches internal diameter, and has about 753 square feet of heating surface, by which the exhaust steam of the engine acts upon the liquid dioxide and converts it into vapor. It then passes through the cold-vapor cylinder and returns to the condenser, which has an internal diameter of 41 inches and about 720 square feet of cooling surface. Valves are set in both pipe systems, so that sections can be cut out for examination and repair without withdrawal of the dioxide. The feed pump is worked by an eccentric on the main shaft, and requires only three-fourths of 1 per cent of the developed power of the engine. The above arrangement of the different parts is of course merely arbitrary, and was adopted to secure the utmost economy of space, but the condenser and vaporizer may be placed in any desired position convenient to the engine and best adapted to local conditions. Thus constituted and arranged, the waste-heat engine at the Technical High School has been run almost continually since the end of September, 1900, without accident or any serious difficulty. During the hours when the storage batteries are being charged, it has been run up to a speed of 168 revolutions per minute.

The load has been a direct-connected, continuous-current dynamo, with a rated output, at 150 revolutions, of 400 amperes and 240 volts, which, as the official report states, was sometimes overloaded as high as 40 per cent as a means of testing the increased capacity obtained by the addition of the waste-heat cylinder. The result, in respect to both steam consumption and electrical output, has been measured by the highly perfected standardized instruments and methods with which the Technical High School is fully equipped. The complete official record is too elaborate and technical for comprehension by other than an expert reader; but it will be sufficient for the present purpose to say that as a net result, the waste heat engine delivered an additional energy equal to 34.2 per cent of that of the triple-expansion steam engine. Its economy is measured by the fact that, when working, it enabled the steam consumption to be reduced from 11.2 pounds to 8.36 pounds per indicated horsepower hour, a very successful result when the smallness of the unit is considered. The same proportionate saving in large engines of 2,000 or 3,000-h. p. would constitute a highly important economy in these days of costly fuel and insatiable demand for vast steam power in electrical power and lighting stations.

While these careful and continuous experiments have been in progress at the Technical High School, a cold-vapor-engine plant has been constructed, put in operation, and tested in actual daily service at the central station of the Berlin Electrical Works in Markgrafen Strasse. This is the oldest of the power stations of the company, and is equipped with what is now considered relatively small units, viz., vertical compound engines of 360-h. p., of Belgian construction, which have an average steam consumption of 18.35 pounds per indicated horsepower hour. With a steam consumption as high as this there is abundant chance for economy by utilizing the waste heat. Moreover, this was a case in which more power was urgently needed at the station. Either the cold-vapor auxiliary plant or a new steam boiler and engine had to be supplied.

Accordingly a cold-vapor engine of 175-h. p. was built by Freund of Berlin, and put in operation in May of this year. It is a single, horizontal cylinder machine, the piston being 17¾ inches in diameter, with 20-inch stroke, and, unlike the smaller engine at Charlottenburg, is geared independently to a directly coupled dynamo, which feeds into the service cables of the company. Working thus as a separate unit, the efficiency of the cold-vapor engine can be measured and recorded with great precision, and the net result may be condensed into the statement that at an average speed of 130 revolutions per minute, it delivers 150 brake horsepower—an addition of 41.7 per cent to the working energy of the compound steam engine, from which it receives and utilizes the waste heat in form of exhaust steam. What this means will be made more plain when it is considered that the combined power stations of the Berlin Electrical Supply Co. contain steam engines which, with an average steam consumption of 12.3 pounds per indicated horsepower hour, have a total output of 142,300-h. p., to which, by the use of cold-vapor engines, there may be added 55,000-h. p. without increasing by so much as a pound the consumption of coal. The system adapts itself with especial readiness to large plants which, like power and lighting stations in growing cities and towns, have to meet a steadily increasing demand for current. This the cold-vapor engine enables them to do without increase of boiler or steam-engine capacity, by simply saving heat energy which has previously gone to waste.

Although it has been from the first in careful and scientific hands, it need hardly be said that the dioxide-vapor engine is as yet in the infancy of its development and application. It has been regarded with skepticism and incredulity by most practical engineers in this country, but these have yielded to the hard logic of its demonstrated efficiency. It has not yet been tested on shipboard, but it is believed that in view of the tremendous losses of heat energy in the condensers of an ocean greyhound, the abundance of cooling water, and with all the incentive to fuel economy at sea, its most important future application may be in connection with marine engines. It has not yet been tested with the waste heat of furnaces, although it is well known that even in the best installations, from 20 to 25 per cent of the thermal energy generated by the burning coal escapes up the chimney. The burnt gases and heated cooling water of gas engines are also a leak of wasted energy which the cold-vapor engine may in future serve to close. Experience shows that in an average gas engine, not more than 26 per cent of the thermal energy of the gas is transformed into work, while 71 per cent is carried off in the waste gases and water circulation.

The report of Professor Josse, from which the foregoing results are derived, goes extensively into the question of comparative costs of installation. Condensed to their most concise compass, his conclusions are that a combined steam-waste-heat plant of 1,600-h. p., including compound steam engines of 1,200 indicated horsepower and a cold-vapor plant of 400 indicated horsepower, complete in every detail, would cost in Germany 212,000 marks ($50,456), while a triple-expansion steam engine of 1,600-h. p., without vapor engine, would cost 206,000 marks $(49,028), a difference of only $1,424, which, with steam coal at $4.15 per ton, as at Berlin, would be saved in a short time by the cold-vapor auxiliary.

Coming down to actual facts, the net cost of the 175-h. p waste-heat-engine plant at the Markgrafen street power station was 49,700 marks ($11,828.60), and of a gas-engine plant, also of 175-h. p., 47,625 marks ($11,334.75), a difference so slight as to be negligible in presence of other and more important considerations.

In the article in our issue of Sept. 26, describing the motors of the Triumph Electric Co., Cincinnati, views were shown of a motor-driven hammer and a lathe. The former was manufactured by the Wais & Roos Punch & Shear Co., and the latter by Messrs Schumacher & Boye, both of Cincinnati. The names of these firms were omitted from the article and we hasten to correct any misunderstanding that may have arisen as to the actual builders of the hammer and lathe.

SUGGESTED AT THE SHOP.

BY F. O. REMAN.

It is rather a strain upon the workman's sense of the eternal fitness of things when he has carefully finished up a tap or reamer to the top notch and then has to turn it over to another fellow to harden. There is little room for certainty about the results that follow the fire and the last state may be worse than the first, but so far as that is concerned, tool steel is always a critical study. Right at the start it is advisable to get your steel with reference to the purpose for which you intend to use it. All steel is far from being alike and it is not the best policy to make punches and lathe tools out of the same bar; it is also a good plan to buy the stock annealed and ready for the cutting off tool. Unless I ordered it myself there never seemed any likelihood of getting it in that condition, the office being apt to leave off anything that looked like frills. I have had men who preferred to do their own annealing for the sake of working in some little kink or another. One had a scheme for softening the steel by the addition of lime when heating. This obtained good results but if the desire be to have the stock thoroughly annealed I have found nothing better than a closed oven with provision for slow heating and a very slow cooling. I have done this in the case of dies where a hub brought up the

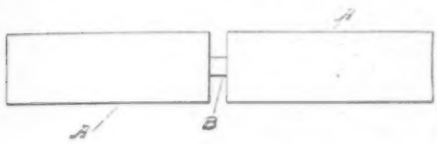


FIG. 1.

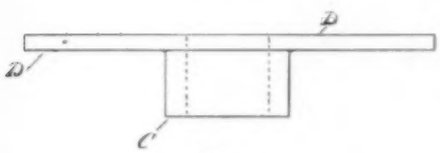


FIG. 2.

work under heavy pressure. A good many watch case dies have been made this way and it is quite an interesting sight to see the hub slowly sink into the soft steel blank.

* * * * *

It is not a good plan to anneal steel to so soft a stage for taps and dies; the soft steel tears and does not cut smoothly. It is better to adopt the water anneal, as it is termed, the steel being quenched in water when it has cooled to a dark red. Steel so annealed will take a nice finish, but is of course more severe on the lathe tools. Hard steel, unannealed, is no easy task for the tyro to cut up into short lengths. After nicking with the cold chisel, or the corner of an emery wheel, the bar may be passed through an opening in the blacksmith's block (sow) and raising the nearest end so that the bar has a bearing on the near side at the top of the opening and the nicked side is on the upper part of the bar but near to the further and lower edge of the hole, a sharp rap with the hammer on the projecting end will usually break off the desired length without trouble.

* * * * *

Tool steel has a definite hardening temperature and it is worth while to try a few experiments with a new lot of steel before risking expensive dies or tools and care should be taken to keep the heat down to the lowest temperature at which it will harden. A cold chisel should be carefully hammered if overheated and the steel may in that way be refined, providing the material has not been burnt. There is no refining the majority of tools, however, after they have been overheated, so far as my experience goes, though I have heard from time to time of various processes to restore burnt steel to its normal condition.

* * * * *

These processes are like the hardening and tempering fluids that are said to have remarkable properties, but as a rule fail to make amends in practice for the mystery in their composition. Probably if brine were to be mentioned as a solution of chloride of sodium there would be far more regard for the familiar salt and water and its efficacy as a hardening fluid. Some men will not take kindly to the suggestion that anything but fire, water and brains may be used in tempering. I have seen prussiate of potash sprinkled on a die with good results, the powder being applied just prior to the water bath. The same thing has been recommended as a covering for the lead bath and there fulfills two objects, as an application to the steel before quenching in the water and as a preventative to the wasting of the lead by oxidation. Some time ago a foreign journal used up considerable space in an account of the merits of ammonia as a tempering medium. Personally I have no experience with this liquid but on the general ground that an acid has a stronger effect on the steel than water, ammonia may be put in the same category as muriatic and sulphuric acids. Water is sufficiently good for most purposes and is vastly more convenient.

* * * * *

The different rates of speed at which the parts of a die will cool are apt to cause trouble, the thin parts being the first to harden, and as the thicker portions cool they draw away from the thin pieces and set up severe strains which

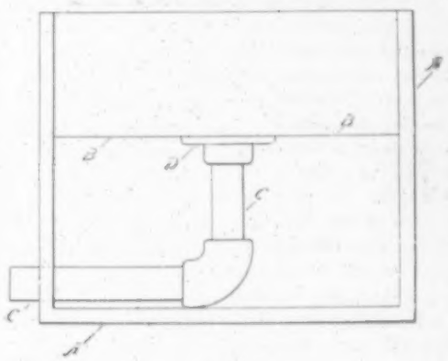


FIG 3.

may cause cracks. Even if it does not cause a crack it weakens the whole thing so that it will not stand the service required of it. There is another peculiarity of this unequal cooling that sometimes prevents a surface getting as high a finish after it has been hardened; and on dies intended for use on metal work that must be highly polished this is a serious blemish. A heated die is of course in an expanded condition and whenever possible provision should be made for cooling the interior as evenly with the outside of the block of steel, otherwise the inner portion will draw away.

* * * * *

Take Figs. 1 and 2, for instance. The round part A is cut into at B, and centered at each end. After hardening, the pieces are ground: being handled two at a time, each half is finished in one operation on the grinder. By winding a little asbestos wicking around the center when hardening, some insurance is obtained against a crack at that point. It is on the same principle that clay is used to fill up the holes that are drilled into dies for holding stripping plates, gauges, etc. At D is a side, or edge, elevation of a formed cutter intended for just such a purpose as cutting the groove around A, at B. The thin portion D is very likely to crack and the former expedient, as winding asbestos on the hub C, is simply out of the question. The Brown & Sharpe Mfg. Co. get over this trouble by cutting several radial slits in D to take care of the uneven expansion or contraction as the case may be.

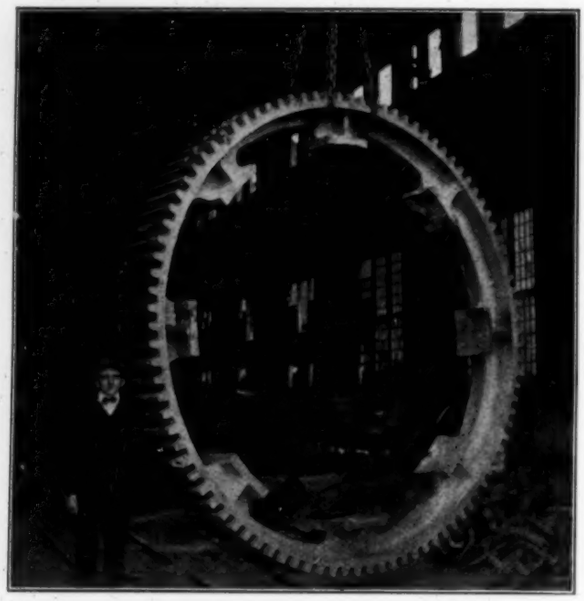
* * * * *

In Fig. 3 is a hardening bath A. There is an inlet pipe C connected with the water supply and at D is a large flange. Across the box A is placed a grid B, resting on the flange D. Suppose we have a large die and that it has been carefully heated to a hardening temperature: it is at once placed face downwards on the flange D, the grid B preventing it from falling sidewise. The water is turned on and directed at the

sunk portions of the die. A box A fills and an overflow pipe permits the pressure of the water jet to be kept up until the block of steel is hardened. The steel is thus hardened in the interior of the cavities first and the surface of the die which is to withstand the working pressure gets a uniform fine and close grain. This explains, too, the reason why it is the safer plan to keep a piece of steel constantly in motion when putting it into the cooling medium.

MACHINE-MOLDED STEEL GEAR.

The accompany illustration shows a machine-molded gear recently cast at the plant of the Pittsburg Steel Foundry, Glassport, Pa. The gear rim is 12 feet 2 inches in diameter, and the weight of the rim is 10,400 pounds. This is one of the largest rims yet turned out by machine molding, and is



MACHINE-MOLDED STEEL GEAR.

an excellent illustration of what can be done in the way of machine-molded steel gears. The Pittsburg Steel Foundry is doing a large amount of this work.

The National Blast Furnace Workers' Union of America was organized at Youngstown, O., last week. The meeting was attended by delegates from furnaces all over the country, and it is claimed that the organization will start out with an initial membership of about 5,000. It will be affiliated with the American Federation of Labor and a charter has already been granted. James McMahon has been elected president; Michael McGlynn, vice-president; Edward Mullen, secretary and treasurer. While the blast furnace workers in different parts of the country have had local organizations, no national organization has ever before been attempted. The formation of this national union is of importance to the blast furnace operators of the country, inasmuch as they have had little serious disturbance in the past from labor troubles. For some time this movement has been under way in the Mahoning and Shenango valleys, with the result that a national organization has at last been formed. The first national convention of the union will be held on Nov. 23, probably in Pittsburg. One of the first demands that the union will make will be for the employment of three instead of two shifts at all furnaces. This will reduce the hours of work from 12 to 8.

The new plant of the Firth-Sterling Steel Co., Smithton, Pa., will be ready for operation in the next two weeks.

The large Carnegie merchant mills at Duquesne were completed last week, after two years' work and at an expense of $2,000,000. The new mill is the largest merchant mill in the world and covers 15 acres of ground. It will employ 1,200 men. The machinery is nearly all automatic.

IRON ORE OUTPUT OF MINNESOTA AND MICHIGAN.

To the Editor:

Attention has been called to a note in *The Iron Trade Review of* August 22, questioning the correctness of statistics issued by the Division of Mining and Mineral Resources of the United States Geological Survey. As I am responsible for the official iron ore statistics issued by the Government, and as your note specially refers to this fact, I call attention to the fact that on page 6 of the monograph on iron ore production for the calendar year 1900, you will find the following: "In augmented output Minnesota leads, closely crowding for pre-eminence as a producer the State of Michigan, which has heretofore held first place. If the shipments of ore during the calendar year and not the production are considered, Minnesota obtained first place." If this is a "discrepancy" it corresponds exactly with Mr. Joseph Sellwood's claim, and both he and myself have fallen into the same error.

Mr. Sellwood and the Duluth correspondent of the *Iron Age*, who made a somewhat similar criticism, in loyalty to the State of Minnesota have evidently failed to note the above excerpt. That there is no discrepancy between the published data is evident from the following:

According to *The Iron Trade Review* the shipments of iron ore from the State of Minnesota in the year 1900 were 9,465,355 gr. tons.

If to the production of iron ore in Minnesota in the year 1900, as given in the iron ore monograph, is added the stock of ore on hand December 31, 1899, and that on hand December 31, 1900, is deducted, it will leave the total amount shipped in 1900, 9,469,564 gr. tons.

Similarly in the State of Michigan if *The Iron Trade Review's* figures are taken, and from the total shipments from the Marquette, Menominee and Gogebic Ranges are deducted the shipments of the mines located in the State of Wisconsin, it will show that Michigan shipped 9,072,099 gr. tons.

Taking the reports of the U. S. Geological Survey and adding to the production of 1900, the stock of ore on hand December 31, 1899, and subtracting those of December 31, 1900, it will indicate a shipment of 9,086,726 gr. tons.

The comparatively slight difference between the figures given by *The Iron Trade Review* and those furnished by the mine owners, is ample evidence that both are practically correct, one checking up the other. The criticisms in *The Iron Trade Review* and *Iron Age* both appeared while I was absent on professional business or they would have received earlier attention.

While every effort is made to secure full and reliable data of all iron ore mined no claim to infallibility is offered; on the contrary full criticism is always welcome. But unless more satisfactory proof is offered than in the note referred to, I have no reason to change any of the figures published. Minnesota has truly won a most notable position as a producer of iron ore, and its record, increasing in eighteen years from 62,124 tons to 9,834,399 gr. tons, is unprecedented.

In recording facts the U. S. Geological Survey has no desire other than to state these truthfully, free from special favoritism for any State of locality. The claim that shipments and not production should be the statistical basis, would certainly not show the status of the iron ore mining industry any more than the sales of pig iron made would necessarily represent the results obtained at the blast furnaces. The peculiar climatic conditions which affect shipments in the Lake Superior region are not applicable to the rest of the producing mines of the United States. There is a strong probability that Minnesota will take the lead as a producer of iron ore without juggling with figures.

JOHN BIRKINBINE.

Philadelphia, Oct. 4, 1901.

The Pittsburg Reduction Co. will put its Canadian plant in operation this week. The plant is located on the St. Maurice river, about half way between Montreal and Quebec. The new plant is reported as having cost $1,000,000 to build and equip, and will have a capacity of some ten tons of aluminum daily.

THE MOLDING MACHINE.*

BY S. H. STUPAKOFF, PITTSBURG.

Introductory.

One of the most remarkable features in the last few decades of the nineteenth century is the radical change in the method of production in our factories. The fields of invention and discovery have been explored of late so wonderfully that this short space of time is not only prominent, but undoubtedly it stands pre-eminent for its marvelous progress. Examine the long lists of new processes, new products, new devises, new means, new machinery, new facts, new knowledge, newly-discovered laws of science, and the new requirements, and it should not surprise you that not only has our vocabulary been greatly enlarged, but also that most of the technical literature of 20 years ago is practically worthless for present use.

Ours is the "progressive age," the period in which the sciences and the arts were first associated and succeeded with their combined efforts in clearing the road to radip advancement. It is but within a space of our lifetime that we have seen the development of the electric light, the telephone, electric power transmission, the gas engine, the phonograph and other new applications of nature's hidden forces, too numerous to mention. Entirely new industries have grown up like mushrooms, good proofs of which are our aluminium, carborundum and calcium carbide factories, and all the others have more or less rapidly advanced. None have lost, but all have profited bv it; not only the manufacturers, but the whole civilized world, employer and employed, dealer and consumer, master and man.

The increased demand for a greater variety, for more and for better articles of manufacture, required the employment of skilled labor and the provision of better means for their production. Skilled labor could not be produced at the same rate as the demand for goods increased. This gave the impulse for the construction of machines, which, served by unskilled labor, would do the work of the handicraft; machines which would do mechanically, speedier and more uniformly than manually, all the work which heretofore was performed only by the hands of the skillful mechanic.

Thus it came about that the large number and varieties of household devises were introduced, and strange to say, domestic servants are today more scarce than ever. Another large group of labor-saving machines of our progressive age are farm implements; yet, did you ever hear of an excess of farm hands? Then we have textile machines, sewing machines, type writing machines, laundry machinery, shoe machinery, type setting machines, wood and ironworking machines of the most improved types, and hundreds of other kinds, even down to excavating machines.

These labor-saving appliances are sometimes attended to, each singly, by one man, sometimes it requires more than one man to run a machine, while in other cases one man can serve several machines very conveniently. Some are semi-automatic and others are entirely so. Some machines require expert operators; others can be attended to by unskilled labor. Some turn out double the amount and others more than twenty times the amount of work a skilled mechanic can show for the same time. No one can question that such machines have helped the manufacturer quite materially. But on the other hand can it be asserted that any of these devises have ever given a surplus of labor? Or, have they reduced the wages of the workingman in general? There are many proofs to show that they have done neither; but, to the contrary, that they were instrumental in improving the lot of the workingman in every instance. Our commonest laborer lives better today, has a better home, is better clothed, gives his children a better education, has better accommodations, is not so hard worked and gets better pay than his predecessors, who toiled hard for their living, and received scanty pay for their work, when there were no machines to fall back on.

Why is it then, that the introduction of labor-saving machines is so frequently opposed and objected to by the workmen in the various trades?

The first thought which occurs to the individual worker is undoubtedly the one, that the machines will replace himself. But that is gross short sightedness. It shows a lack of self confidence. It is true only in rare instances, and if at all, it causes only temporary inconvenience to the workingman, by possibly changing his specific occupation. Yet it is far reaching in the betterment of the lot of the workingman in general; it gives the better man better chances for advancement. It gives the expert mechanic more opportunities to apply and to prove his skill; it increases his wages in all cases; it removes from him all monotonous operations; it gives him better and more chances to use his brain and think of further improvements; it elevates him from the every day laborer to a higher position, and it causes him to rise in the esteem of his employers and co-workers. His services are more sought and better paid, and his skill becomes the more valuable, the more machines are used to perform the regular run and always re-occurring work of his particular trade. Still, it takes some time before such facts become universally known and appreciated. There are always people who make it their business to antagonize, to cause disturbances, to spread false truths, to create wrong ideas and conceptions and therewith to impose upon others who are weak-minded and easily led. Though they may be sincere and convincing in their utterances, such men are false prophets, who do incalculable harm by opposing the natural course of progress. They advance, invariably, old-fashioned ideas, which might have suited in medieval times, or at the time of the Guilds; arguments which do not fit the case at all, as it should be dealt with in the twentieth century. Yet, such men have quite frequently a marvelous number of disciples, principally because they claim to appear as benefactors, as representatives and as mediators for the working classes.

Manufacturers as a rule do not look at the matter in this light; though there are many among them who hesitate a long time before they will consent to make a change from hand work to the use of machinery. Most of them will watch what their competitors are doing; they will let others do the experimenting; they will let others carry the expenditures to obtain results, and they will let others work out difficult problems without giving them much encouragement. This class of manufacturers is not less short sighted nor more progressive than the parties above mentioned, though they are generally esteemed as the conservative element. No doubt they will get there, slowly but surely, providing they do not lose sight of what is going on around them. Yet there are many other wide-awake producers, who see that there are many processes of manufacture in their particular line of work which could be materially improved upon with a view to lessen the cost of their products, if suitable machinery could be substituted for manual labor. As business men they will consider this question merely as a business proposition—as a survival of the fittest. They will submit their problems to competent engineers, who are able to turn a crude idea into tangible shape, to experts who can design and construct machinery for them to suit their purpose.

A striking proof of what can be accomplished in this direction is best illustrated by the present labor-saving appliances in use for handling grain, ore, and coal, in docks and at blast furnaces and especially by the equipment of modern rolling mill plants. The large fortunes which have been made quite recently by some of the most progressive iron and steel manufacturers speak for themselves. They were founded almost exclusively upon a reduction of the cost of production, and to a large extent upon the application of the best obtainable labor-saving machines.

The fact that such vast, important and far reaching improvements were introduced in the rolling mill practice, should almost lead to the conclusion that necessarily all associated branches of the iron and steel industries were compelled to keep in line with it, and that they have advanced at a like pace. But it is noticeable that, especially in the foundry practice, this was not the case.

It cannot be said that the foundry has not advanced. Undoubtedly it has made a great step forward, and in the right direction, with the introduction of chemistry and physical re-

*From the October, 1901, *Journal* of the American Foundrymen's Association.

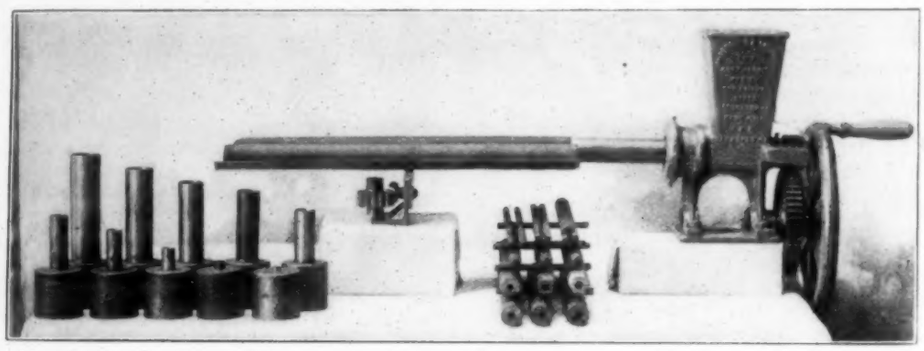
search. The rule of thumb methods have been almost universally abandoned, and some of the larger foundries, especially those making comparatively small specialties, have introduced methods and appliances which reduce manual labor to a considerable extent. Sand and mold conveyors, sand mixers and traveling cranes at present in use, are among those of the most universal applicable labor-saving devises in the foundry. There are a number of special contrivances, some good, some bad, too numerous to mention, which may be used to advantage here and there, but the most desirable labor saver in the foundry: a universal, really practicable and serviceable molding machine, is still an open question. Many minds have worked on the solution of this problem, and manifold were their productions. The object of this monograph shall be to describe, to illustrate and to discuss in an impartial manner the various methods which were employed, the results which were obtained and the difficulties which are encountered in the construction of a reliable molding machine, and the attempt will be made to describe in detail the adequate requirements necessary to obtain desired results, besides outlining the future possibilities of producing, successfully, miscellaneous sand molds by machinery.

The nature of this subject does not promise it to be a very fascinating topic; yet, owing to the importance of the question it is thought that the treatment here given may arouse the interest of the foundryman sufficiently to follow the matter through. At all events it will make him acquainted with what has been done, and what can be expected of the molding machine in the future. Then, after a careful perusal, he may give the question of machine molding his impartial study and consideration.

WADSWORTH AND SHERWIN CORE MACHINE.

At the regular meeting of the Foundrymen's Association at Philadelphia, Wednesday evening, October 2, the following brief description of the Wadsworth and Sherwin core machine was presented by Geo. H. Wadsworth, of Cuyahoga Falls, O.:

"You are all no doubt familiar with the old process of making cores by the old method of core boxes, putting in the sand and ramming by hand. In some instances cores are made in two halves and pasted together to make a round core. In other cases the core box is made the size and shape of the core required, and after the core is rammed up, the box is parted to allow the core to be taken out and put on a core tray to be placed in the oven. By either process the work is slow, tedious and very unsatisfactory, as a core of any length to get strength enough to stand up to its work has in most cases got to have a rod or wire put in. This also adds to the expense of making cores by this process. There is always considerable loss, as cores made by this process are very delicate and will stand but very little handling. There is also the trouble, annoyance and expense of keeping the wooden core boxes in perfect condition and being ready for use when wanted. If any of you have been connected directly with the core room, you will no doubt recall having experienced trouble at some time or another, either from the fact of your core boxes wearing out of shape, or being misplaced and cannot be found just at the time when you want to use them, and often in cases necessitating sending to the pattern shop and having new core boxes made, causing considerable delay and expense.



WADSWORTH AND SHERWIN CORE MACHINE.

"With the Wadsworth and Sherwin improved core machine we make ten sizes of cores from ⅜ to 1½ by ⅛ round cores; also square, hexagon and D, or cores of other irregular shapes. In lengths of 24 inches we have a capacity of 120 feet of any size of these cores in one hour. All cores are perfectly straight, and perfectly vented from end to end, and the machine is always ready for immediate use. The cost of production, taken upon a basis of 10 cents an hour, or $1 per day, is, for 12 feet of finished core, 1 cent. It will save from $1 to $5 a day, depending upon the number of cores used. It is a tool that has long been wanted in the core room. There are very few parts to wear, or get out of repair, and all parts being made duplicate, any piece of the machine can very easily be replaced at small cost.

"We claim for a core made on this machine over the hand-made core, first, cheapness; second, strength, as no rods have to be used with a core machine made; third, over half the oven space can be saved, as all the cores are of one piece and are perfectly vented and evenly rammed from end to end. This allows the vent to be taken from the core and reduces the risk of losing casting by a blow from the cores."

The continuous mill in the upper plant of the American Steel Hoop Co., at Youngstown, O., has gone on double turn making cotton ties. Orders are equally good in the other mills of the same company.

The Ajax Metal Co. of Philadelphia submits the following data concerning a test of Ajax plastic bronze, made in the rolling mill of Hughes & Patterson, Philadelphia: "Test made on hot bar mill, placing Ajax plastic bronze brass on one end and phosphor bronze brass on opposite end: Nov. 15, 1900, brasses placed in position measured ⅞ inch in thickness. Feb. 27, 1901, brasses taken out, phosphor bronze then measured ⅜ inch and plastic bronze ⅝ inch. Phosphor bronze brass, being worn down to useful limit, was discarded. Feb. 27, 1901, new phosphor bronze brass placed, original plastic bronze bearing being used. Apr. 29, 1901, again taken out. Second phosphor bronze brass worn down to useful limit, ⅜ inch, while plastic bronze still measured 7-16 inch, thus showing a saving of over 100 per cent in favor of Ajax plastic bronze.

Officials of both the American Car & Foundry Co. and the Pressed Steel Car Co. have denied the report that negotiations are on for the consolidation of these two concerns. Promoters have discussed the question with the officers of both companies, but the matter has never been seriously considered by the boards of directors.

Officers of the Acme Machine Screw Co., which was established in Hartford, Conn., four years ago, announce that the business will be moved to Cleveland next spring. The reasons given are that the bulk of the business of the concern is in the middle West, and the handling of raw materials would be more profitable in that section.

CINCINNATI MACHINERY TRADE.

The best evidence that machine tool makers in Cincinnati are having a good business is the fact that prices on the output of some of the largest have been advanced. This advance was made about a month ago to go into effect in some cases Sept. 15 and in others about Oct. 1. As far as can be told from the condition of the trade today, the advance has not lessened the amount of orders.

The demand for machine tools is coming from all parts of this country and there is even some improvement noticed in the amount of business from across the water. England has been buying more liberally and some good orders have been placed here by English concerns.

The advance that has been made by some of the larger tool builders can be traced directly to the fact that they were filled up with business. In this condition they felt warranted in putting up prices, believing that this might keep them from being buried with orders for delivery so far ahead that before they could be filled the iron market might go up and absorb all profit. It is also stated that the labor cost of machinery is greater than it was some time ago.

Manufacturing enterprises in this district are busy and are needing more tools continually. The same condition exists largely outside as well and the business of the country is judged to be very satisfactory if the needs for machine tools are so considerable.

The Lodge & Shipley Machine Tool Co. will soon begin work on excavating 100,000 cubic yards of earth from the lot the company recently purchased and on which it will erect a large addition. The company now owns 262 feet on Colerain Ave. by 315 feet deep and has bought a strip of this width clear through to Spring Grove Ave. making about 315 feet wide on Colerain, extending 1,000 feet through to the other street. The present site is 2 acres in extent and the new ground acquired is 4 acres.

The first heat of the Norwood Foundry, situated near the big plant of the Bullock Electric Mfg. Co., was run this week. The foundry was located as it is because there were several factories in Norwood that would use castings from it, the stockholders in the new company being the same people that are in the Hoeffinghoff & Laue Co. and the Bullock factory.

A contract for $90,000 worth of building work was awarded last week to the American Bridge Co. of Pittsburg for the new power building that is to be erected on Eighth and Sycamore Sts. It will be 10 stories high and about 90x100 feet. It is to be of the heaviest iron and steel construction.

The J. A. Fay & Egan Co. has been awarded a contract for 19 more mills like an experimental mill built by the company some time ago. The buyer is a London corporation that has the contract for supplying a great amount of kindling wood to the public institutions of London. The mill is on the principle of a rip saw mill, and there are three saws that turn a log into kindling wood before it comes out. Patents have been taken out covering the new mill.

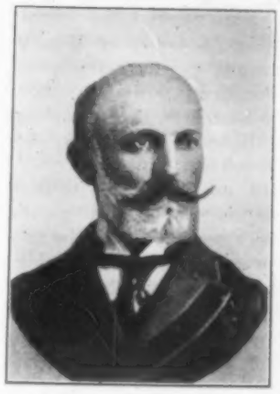
A contract has been awarded to the Laidlaw-Dunn-Gordon Co. branch of the International Steam Pump Co. for two large pumps to be shipped to Calcutta, India, where they are to be used on the public docks. They are of 1,000,000 and 2,000,000 gallons capacity respectively.

The Blymyer Iron Works Co. received this week a silver medal awarded last month by the Peruvian government for the display of sugar, coffee and rice machinery and bells at the permanent Exposition at Lima. The same concern has received an order this week for six sugar mills for the island of Formosa, the mills being arranged to be operated by animal power.

The Bullock Electric Co. has received an order for electrical machinery for the Portland Cement Co.'s new plant at Vancouver. The contract is for $90,000 worth of work and calls for three 750-kilowatt generators and 60 motors of various sizes, ranging from 7 to 150-h. p.

It is officially denied that the officers of the Republic Iron & Steel Co. are considering a bond issue of several million dollars.

DEATH OF HENRY W. CRAMP.



HENRY W. CRAMP.

Henry W. Cramp, the eldest son of the famous shipbuilder, Charles H. Cramp, and the vice president and treasurer of the Cramp Ship and Engine Building Co., died at Devon Inn., Philadelphia, Oct. 3. Acute pneumonia, following a general breakdown due to hard work, was the immediate cause of death.

Mr. Cramp was born in Philadelphia, in 1851, and after completing his education entered the machine shops of the I. P. Morris Co. to learn the practical side of the shipbuilding trade's most important branch. Ill-health interrupted his plans for learning a mechanical trade, and he went to sea for two years in the service of the Clyde line. Later he was in charge of the New York office of the company when it operated the Erie basin dry dock. In 1886 he succeeded his uncle as secretary of the shipbuilding concern and on May 12, 1891, he became a director. He was elected vice-president and treasurer on June 6, 1895.

Essentially a business man, few equaled him in quickness of perception as to the merits of any enterprise brought to his notice. His devotion to business was intense. Except on the command of physicians he had never taken a vacation. Mr. Cramp was a member of the Union League, Art, Country, Metropolitan, Merion Cricket, Penn, Corinthian Yacht, Rittenhouse, Manufacturers, Radnor Hunt and Bachelors' Barge Clubs.

Pittsburg Foundrymen's Association.

At the regular monthly meeting of the Pittsburg Foundrymen's Association held at Pittsburg, Monday evening, Oct. 7, officers for the ensuing year were elected as follows:

President, John McClaren, of Phillips & McClaren.
Vice President, T. P. Thomas, of Sterrit-Thomas Foundry Co.
Treasurer, Philip Mathes, of Brittain & Mathes Co.
Secretary, F. H. Zimmers, of Union Foundry & Machine Co.
Executive Committee: Wm. Yeagle, of Wm. Yeagle & Co., Limited; S. D. Sleeth, of Westinghouse Air Brake Co.; Robert Taylor, of Taylor, Wilson & Co.; Davis Evans, of Pennsylvania Casting & Machine Co.; S. H. Stupakoff, of Vulcan Mfg. Co.

The retiring officers were tendered a vote of thanks and President McLaren assumed the chair. The business before the meeting, which consisted of changing the time of meeting to the first Monday in the month, was quickly disposed of.

Mr. S. H. Stupakoff of the Vulcan Mfg. Co. of Pittsburg then read a paper on "The Molding Machine," which was merely an introductory to a number of additional papers on this subject which will follow. Mr. Stupakoff intends to make an exhaustive study of molding machines and the result of his researches will be given to the American Foundrymen's Association from time to time. That the subject will be thoroughly covered is well known to all those associated with the American Association and Mr. Stupakoff will gladly receive any assistance or suggestions which will aid him in his task.

After the meeting adjourned a lunch was served.

The Braddock plant of the American Steel & Wire Co., Braddock, Pa., will have installed a new 2,000-h. p. tandem compound engine within three months. The installation of this engine will increase the output of the plant about 25 tons daily.

In order to increase the efficiency of his business of buying supplies for manufacturing plants, Eliot A. Kebler, of Pittsburg, Pa., has taken into his office, Thomas W. Shaw, who for many years has been in the purchasing departments of some of the large steel companies.

WILLIAM BARRETT RIDGELY.

An Iron Manufacturer Becomes Controller of the Treasury.

The recent appointment by President Roosevelt of Wm. B. Ridgely to be controller of the treasury, was the carrying out of the announced purpose of President McKinley. Three generations of the Ridgely family have been in the banking business at Springfield, Ill., Mr. Ridgely's grandfather becoming cashier of the Bank of Illinois in 1835.

Wm. Barrett Ridgely was born in Springfield in 1858. After graduating from the public schools he went to the Rensselaer Polytechnic Institute at Troy, N. Y., and in 1879 received the degree of civil engineer. Returning to Springfield he became connected with the Springfield Iron Co., and his work on the technical side of the business included iron and steel manufacture and coal mining. He was also identified with banking and other interests, being made vice-president of the Ridgely National Bank and president of the Springfield Gas Light Co. In time he was advanced to the position of vice-president and general manager of the Springfield Iron Co., and he held this position in 1899, when the company sold out to the Republic Iron & Steel Co. The

WILLIAM BARRETT RIDGELY.

managers of the latter made him district manager, a year later electing him secretary.

Mr. Ridgely has given a good deal of attention to politics, but never has held an elective office. He was postmaster at Springfield from May 1, 1897, to May 1, 1899; he has been a member of the Republican central committee in the same city, and he served two terms as secretary of the Illinois League of Republican Clubs. He is a member of the Iron and Steel Institute of Great Britain, the American Society of Mechanical Engineers, and the American Institute of Mining Engineers. His wife is the daughter of Senator Cullom, of Illinois.

The contract for the electrical equipment of the main power house and subway stations of the Rapid Transit Railroad was awarded last week by John B. McDonald to the Westinghouse Electric & Manufacturing Co. Although the value was not made public it is understood that at least $1,500,000 will be expended on the equipment. Among the apparatus provided for in the contract are six 5,000-kilowatt alternators, three 250-kilowatt exciters, twenty-six 1,500-kilowatt rotary converters, seventy-eight 550-kilowatt transformers, and eight motor-generator starting sets. The third-rail system has been definitely adopted as the motor principle for the underground road. The steam plant will consist of twelve 7,500 to 11,000-h. p. engines, each of which will drive a 5,000-kilowatt generator. It is expected that it will take two years to erect and equip the main power house, which will be the largest of its type in the world. The contract must be completed by Jan. 1, 1904.

BESLY BAND POLISHING WHEEL.

The complete machine consists of pedestal, countershaft, and spindle to hold either one or two emery band polishing wheels. These wheels are made of cast iron. An elastic surface is produced by a felt covering. The emery or other abrasive material is a piece of emery cloth which is tightened firmly around the wheel. To reset the wheel, or change the grade of emery it is necessary only to remove a band and replace it with another, an operation requiring about a minute. It is stated that one of these wheels will take the place and do the work of a number of polishing wheels. The wheels when used with emery bands are balanced and ready for use. This machine is suitable also for shops where skilled polishers are

BESLY BAND POLISHING WHEEL.

not employed. The manufacturers, Charles H. Besly & Co., Chicago, also make band grinders with one wheel mounted on the spindle with the other end of the spindle suitable for buffing; also with cushioned or with hard surface.

Carnegie Armor Plate Plant—Bar Mill Starts.

As we stated last week, it has been definitely decided by the Carnegie Steel Co. to increase the capacity of its armor plate plant to meet the demands of the shipbuilders for armor plate on the big order now being filled by the Carnegie Steel and Bethlehem Steel Cos. More than $3,000,000 will be spent in enlargements and improvements and plans have advanced so far that work on the improvements can be commenced in a short time.

The new merchant bar mills of the Carnegie Co. at Duquesne, Pa., were placed in operation last week and are now on in full. The new plant occupies 15 acres of ground and consists of two mills, a 13-inch and a 16-inch, with 10 sets of rolls. The main building is 100x250 feet and the shearing building 200x450 feet. The furnace building is 60x200 feet. There are a number of other buildings, including a boiler house, machine shop, power plant, engine room, etc. The construction work was done by the American Bridge Co. The plant will be in charge of Howard H. Williams, who was at the head of the American Steel Hoop Co. plant at Mingo Junction.

A company is being organized in Paris, France, for handling in France, Belgium, Switzerland, Spain, Portugal and their dependencies, the patents and rights of George Westinghouse, including those on air brakes. The new concern will take over the business of the Societe Industrielle d'Electricitie Processes Westinghouse, which controls the Westinghouse interests in France.

AMONG CLEVELAND MACHINE SHOPS.

The Browning Engineering Works, at Collinwood, one of Cleveland's suburbs on the east, has some 200 men busily employed in the manufacture of cranes. The firm makes electrical apparatus for crane service and is having difficulty to keep up with the demand and at the same time clear up the shop and yard from the debris of recent construction. The latter can wait and it is likely that the shop will run overtime, a condition of affairs that obtained up to a recent date. Two 10-ton electric cranes are on the floor in process of construction along with a large gas producer. The latter, together with one of the cranes, is built to the order and design of the Wellman-Seaver Engineering Co. of Cleveland; the other crane is for shipment to Sharon, Pa. The Browning Engineering Co. has been given a contract to supply the Dallas & Ft. Worth Railroad with a 30-ton crane and power house equipment.

The new plant of the John C. Kuhlman Car Co. at Collinwood will be in operation about the middle of December. The site covers 30 acres of land with 11 buildings. The old company has a plant on Broadway, in Newburg, with a capacity of 120 cars a year; the new company expects to have an output of 600 cars a year and to employ 450 men.

The Acme Foundry Co. is preparing to build a new plant at the corner of Sawtelle avenue and Sweeney street and the present foundry will probably be abandoned. The new plant is to have double the capacity of the old one and will cost $50,000. The capital stock of the company is likely to be increased at an early meeting of the stockholders.

The Chase Machine Co., marine machinery, gas and gasoline engines, etc., has just completed and shipped one of its worm-geared, friction-driven engines to the order of the Pittsburg Coal Co. This machine is designed, to operate the spout of a coaling plant. Lines from one set of drums raise and lower the spout, and the other drums swing it in or out.

The Brown Hoisting Machinery Co. is at work on a 100-ton pontoon crane for the Brooklyn navy yard. It is to rest on a pontoon 60x100 feet and will have an overhang at either end of 45 feet; the total length of travel being 190 feet. At 45 feet overhang the crane will have a lifting capacity of 100 tons. The crane is provided with automatic counterweights so that the pontoon only lists three inches in picking up a 100-ton load. The pontoon is being built at the Cramp's Ship Yard, Philadelphia, and the entire equipment will be completed before the end of the year.

The Lane Tool Co. has recently completed and delivered two stam hammers, one 1,000 and another 1,500 pounds, to the Cleveland Hardware Co. and the latter firm has duplicated the order for the larger machine.

The Cleveland Punch & Shear Co. has a number of orders in hand for unusually heavy machinery. A double-acting plate planer is under way to the order of the Riter-Conley Mfg. Co., Pittsburg, and an angle shear for the Garry Iron & Steel Co. of Cleveland, and a miscellaneous lot of punches and rotary planers being at the present time in process of erection.

The Garry Iron & Steel Co. is having a brisk demand for its new pneumatic crane. This has a very simple piston action and is very convenient for railroad use or in any similar position

The new machine shop of the Variety Iron Works will be completed in the next 60 days and the old plant will then be dismantled and the tools moved to the new location. The new shop will have complete hydraulic, electric and pneumatic equipment. A spur track will be laid down the center of the main building in continuance of the former line. The heating arrangement will be after the Sturtevant pattern, and the lighting will be designed on the best lines of modern practice.

The contract for the ornamental iron work for the new union depot at Pittsburg has been awarded to the W. S. Tyler Co. by the Pennsylvania Railroad Co. for the sum of $100,000. The company has 700 men employed as against 50 but 15 years ago. The secretary and treasurer, Proctor Patterson, and M. P. Reynolds of the W. S. Tyler Co., have been in New York City during the past week in reference to a number of Eastern contracts.

The Acme Machinery Co. bolt, nut and rivet machinery has an exhibit at Glasgow, Scotland, and reports results from this long range enterprise to be very satisfactory. Business in Great Britain and on the Continent is fairly good, England and France making by far the greater demand. The firm is well pleased with the present condition of trade and has a brisk business at home.

The Snider-Hughes Co., builder of pumping machinery, has installed a water works plant at Cuyahoga Falls, O., and feels elated over the results of the test conducted by its engineers.

From time to time reports come to hand in reference to the improvements in the construction of substitutes for the common everyday wooden barrel that will render obsolete all processes or machinery employed in the manufacture of the latter. John S. Oram, manufacturer of heading, stave, keg and barrel machinery, does not seem to worry about any of these suggestions and reports present business and prospects for more to be very good. Mr. Oram and his product have an international reputation. He has sent equipment at short notice to Russia and other countries.

The Plow Works Consolidation.

The plow interests of the country are progressing towards a consolidation of their properties in the American Plow Co. It is said that the stockholders of the constituent companies are to receive for their holdings 25 per cent in cash and the balance in stock. Some dissatisfaction has arisen and it is reported that W. S. White, representing the United States Mortgage & Trust Co. of New York, which has played a prominent part in promoting the combination is conferring with officials of the Moline Plow Co. at Moline, Ill., for the purpose of inducing them to join or sell out. Among the more important concerns which have been mentioned in connection with the consolidation are: Deere & Co., and the Deere & Mansur Co., Moline, Ill.; Union Malleable Iron Co., East Moline; David Bradley Mfg. Co., Bradley, Ill.; Grand Detour Plow Co., Dixon, Ill.; Bettendorf Metal Wheel Co., Davenport, Iowa; Kingman & Co., and the Kingman Plow Co., Peoria; Peru Plow & Wheel Co., Peru, Ind.; Saltley Mfg. Co., Springfield; Fuller & Johnson Mfg. Co., Madison, Wis.; Gale Mfg. Co., Albion, Ind.; Bucher & Gibbs Plow Co., Canton, O.; Syracuse Chilled Plow Co.; B. F. Avery & Sons, Louisville, Ky.; South Bend Chilled Plow Co.; Hench, Dronogold & Co., and the Stoddard Mfg. Co.

Judge Wm. A. Vincent, of Chicago, has been the active organizer, and the underwriting syndicate is headed by President A. S. White and Charles R. Flint.

A New Shoen Car Wheel Plant.

Charles T. Schoen, the inventor of the pressed steel car will shortly organize a company to manufacture a new type of steel car wheel. The plant is to be located in the Pittsburg district and it is said that a site of 25 acres has already been secured. The demand for a stronger car wheel, due to the heavy steel cars now used by the railroads, has been made by the railroads all over the country for some time and the iron wheel as now constructed does not always meet the requirements of the railroads. Although no patents have yet been granted on the new Schoen type of steel wheel, we can state on reliable authority that it is to be made direct from the steel ingot. Upon being removed from the furnace the ingot is subjected to hydraulic pressure, the center of the wheel being made in this way. The axle hole is next punched out. The rim and flange of the wheel are put on by the operation of both horizontal and vertical rolls much after the operation of rolling beams. It is also the intention to harden the rim of the wheel by some well known steel hardening process.

Mr. Frank L. Shallenberger, well known to the coal trade in connection with the supply of mine equipment, has recently associated himself as a partner in the Hockensmith Wheel & Mine Car Co., of Irwin, Pa.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of their Wants:—

The Ohio Steel & Iron Specialty Co., of Cuyahoga Falls, O., was incorporated last week with a capital of $75,000.

The Summit City Machine Co. of Akron, O., incorporated last week with a capital of $20,000 for the purpose of manufacturing and repairing machinery, has S. C. Smith, J. A. Hay, O. A. Sorrick, C. H. Frain, C. W. Jones and W. H. Snyder as incorporators.

The Cornwall Iron Co., of Cornwall, Lebanon county, Pa., was incorporated this week with a capital of $600,000. E. C. Freeman, R. P. Alden, I. C. Freeman, M. C. Buckingham and Sarah C. Derby. Eight hundred shares in the new company were signed over to each of the directors in consideration of the transfer of the Bird Coleman furnaces, consisting of two blast furnaces, the machinery and equipment with the tract of land and appurtenances, the whole being valued at $360,000, and 596 shares additional were placed to the credit of each of the directors in consideration of the transfer of the North Cornwall furnace, consisting of one blast furnace and the necessary machinery, valued at $179,000.

Stockholders of the Buehler Machine Co. of St. Mary's, O., recently incorporated with a capital of $10,000, elected directors and officers as follows: A. C. Buehler, president; Albert Buehler, vice-president; Wm. Jasperson, secretary; E. Buehler, treasurer, and Brownell Buehler. The new company will install its plant in the buildings recently occupied by the Auglaize Machine Works.

The Racine Malleable & Wrought Iron Co., of Racine, Wis., has increased its capital stock from $25,000 to $200,000.

The Lees Machine Co. of Owensboro, Ky., has been incorporated with $25,000 capital. W. F. Lees, H. A. Lees, K. Lees, J. H. Parrish, W. D. Osborne, A. J. Daniels and J. E. Delker are the incorporators. The company will manufacture wood working machinery and in addition will manufacture all kinds of castings for machine purposes.

The Donvar-Mills Smokeless Furnace Co., of St. Louis, Mo., has been incorporated with $25,000 capital. D. A. Brislin, Frank Gaiennie and Robert T. Stilwell.

Foundry promoters of Chicago, Ill., have written to the Youngstown, O., chamber of commerce for a bonus to secure a location of a large foundry in their town. The promoters ask a bonus of a site consisting of 12 to 16 acres and the necessary buildings to cost no less than $25,000.

The Walker Engineering Co. of Youngstown, O., was granted a charter last week with capital stock of $50,000. George E. Rose, J. W. Rogers, C. L. Walker, M. A. Norris and J. W. Long are the incorporators. The new company will do a general foundry, machine and forging business. C. W. Walker, the promoter of the company, now has a large machine shop at Youngstown, O., but the new company will probably dismantle this plant and locate on a larger site.

The Grove Machine Works, Columbus Grove, O., recently owned and operated by Walter Fruchey, but which has been closed for some time was sold at mortgagee's sale last week to Alfred Morris, who will continue the business.

At a meeting of the stockholders of the LaBelle Iron Works, Wheeling, W. Va., to be held on Oct. 15, the capital stock of the company will be increased from $2,500,000 to $3,000,000. The recent improvements to the company's property at Steubenville, O., have necessitated the increase.

The Niagara Machine & Tool Works, of Buffalo, N. Y., was in corporated last week with $200,000 capital to engage in the manufacture of tools and machinery. Julius W. Georger, A. E. Heinz, C. M. Hughson, F. C. Bautz, O. J. Bautz, George A. Bautz and G. R. Munschauer are the incorporators.

The American Composing Machine Co., Atlantic City, N. J., has been incorporated with a capital of $10,000. The incorporators are: Levi C. Albertson, Joseph H. Marvel, John W. Hackney. The company will manufacture a line of printing machinery.

Albert C. Middleton, Leon F. Douglass and Charles K. Haddon have obtained a charter of incorporation for the Victor Talking Machine Co., Camden, N. J., and will manufacture sound-producing machines; capital, $2,500,000.

The International Garrigus Boiler Cleaner Co., Camden, N. J., has a capital of $1,500,000 and will manufacture boiler cleaners. The incorporators are: F. R. Hansel, Wm. F. Eidell and John A. MacPeak.

The James F. Powers Foundry Co., Elkton, Md., is erecting a new building of brick and granite, 150 x 40 feet, to be equipped with modern machinery for increasing capacity; Jas. F. Powers, president.

The Crawford Bicycle Co. at Hagerstown, Md., is installing additional machinery for increasing its capacity.

The firm of Moffet & Banholzer, Birmingham, Ala., started in business about the middle of August. Both gentlemen had been with the Birmingham Foundry & Machine Works for some seven years: Mr. Moffett had been foreman of the pattern shop, but was later in the drafting room, while Mr. Banholzer was foreman of the foundry. They occupy two of the buildings formerly used by the Birmingham Traction Co. and will confine themselves strictly to foundry work.

Fires and Accidents:—

The brass foundry of Charles Mousley & Co., Philadelphia, Pa., was destroyed by fire last week; loss, $7,000.

H. N. Barth's boiler manufacturing plant at Charlevoix, Mich., was destroyed by fire recently; loss, $4,000.

The blacksmith shop of the car shops of the American Car & Foundry Co., Terre Haute, Ind., was damaged to the extent of $25,000 by fire recently.

The plant of the Gibsonburg Machine Co., Gibsonburg, O., was destroyed by fire last week, entailing $20,000 loss.

The plant of Lancing & Kinney, Jersey City, N. J., was damaged to the extent of $5,000 by fire last week.

New Construction:—

The Hartford Foundry Co., Hartford, Conn., has plans prepared for a new foundry.

The Bentel & Margedant Co., Hamilton, O., will erect a new foundry in connection with their present plant. The new plant will be 102 feet long and 48 feet wide.

Joseph T. Ryerson & Co., Chicago, Ill., will erect a plant at Toledo, O., Marine boilers will be a specialty. The buildings will cost $21,000.

R. J. McIntyre will erect a new foundry at Allentown, Pa. It will be 105 feet long and about 50 feet wide.

The Goulds Mfg. Co., Seneca Falls, N. Y., will build an addition to their machine shop, 280 feet long and 96 feet wide.

Baker & Shevlin Foundry Co., Saratoga, N. Y., will make large additions to their foundry and machine shop. Five new buildings are to be erected.

The Hudson Valley Electric Railroad Co. will erect a new machine shop at Stillwater, N. Y.

The Mahoning Foundry & Machine Co., Youngstown, has let contracts and broken ground for the new plant. The contract for the buildings, steel frame with brick and stone construction, has been awarded to the Penn Bridge Co. of Beaver Falls. The main building will be 240x132 feet.

It is said that the McKeesport Mfg. Co., McKeesport, Pa., is to erect a sheet mill in the Pittsburg district.

The Kidd Bros. & Burger Steel Co., Pittsburg, manufacturers of polished steel drill rods, needle wire and black steel rods, are increasing equipment and have also decided to erect a new plant at Aliquippa, Pa., about fifteen miles from Pittsburg. The firm will put in a plant for the manufacture of crucible steel and has secured 9¼ acres. The addition to the present equipment includes a new wire bench, new straightening machinery for the larger sizes of wire up to 2½ inches, and a stand of 6-inch rolls for shape work.

W. R. Emery, representing Chicago capitalists, is trying to locate a foundry at Youngstown, O., which will include a finishing department, machine shop, and will make special casts. The concern will employ from 200 to 300 men. An investment of $100,000 is offered if a site and buildings which would not cost more than $25,000 are donated.

The Chattanooga Plow Co., at Chattanooga, Tenn., will erect a one-story addition, to cost $1,500, to its foundry.

The Alabama Consolidated Coal & Iron Co., Ironaton,

Ala., expects to have completed relining No. 1 furnace and blown it in by Oct. 15, and will then probably enlarge No. 2 furnace.

The Central Iron & Coal Co., Tuscaloosa, Ala., is reported as to build another 200-ton furnace in addition to the plant reported lately. The Southern Railway Co. is now building an extension of the Mobile & Ohio Railroad into the company's property, to facilitate developments. Jos. Lodge is division superintendent.

The Coulter & McKenzie Machine Co., Bridgeport, Conn., has purchased a tract of land as a machine shop site and will commence building operations as soon as water front improvements are undertaken by the city and national government.

The Wulbern Machine & Foundry Co., Birmingham, Ala., has erected a 120x50-foot building, and expect to be in full operation about the middle of the present month. This is a new company; the president being Allen W. Krebs; vice-president, J. Wulbern; secretary, Louis G. Wulbern.

The Louisville & Atlantic Railroad Co. has decided to locate its general machine shop in Richmond, Va., and work on the plant is to begin at once.

The South Chester Pipe & Tube Co., Chester, Pa., contemplates the building of a rolling mill in connection with the present pipe and tube plant. The structure will probably adjoin the plant of the Tidewater Steel Co. and will be used to supply material for the tube mill.

The American Iron Works, Des Moines, Ia., has recently enlarged the plant, installed a large steam hammer and other machinery and rebuilt the foundry.

The Republic Iron & Steel Co. is reported as to blow in its new blast furnace at Thomas, Ala., about Dec. 1 and immediately after begin the construction of another furnace of same capacity. The company will also open up three more coal mines, erect coke ovens, open up a red-ore mine and build four washers.

Wm. Jessop & Sons, Sheffield, England, have given bond to the Canton Land Co. and the Gordon Land Co. in the sum of $20,000 to erect and maintain a steel plant at Washington, Pa., in operation for at least five years. Most of the contracts have been let and active work has commenced.

The Pittsburg District:—

The Westmoreland Steel Co. of Pittsburg, Pa., whose plant is located at Greensburg, Pa., was incorporated this week with a nominal capital of $1,000. The actual capitalization is $200,000. Further particulars about the incorporation of this company have been referred to in previous issues.

J. L. Woods, A. B. Cody, E. S. Woods and S. W. McMunn, Chicago, stockholders of the Paige Woven Wire Fence Co., were in Pittsburg this week and visited the company's plant at Monessen, Pa. The steel capacity of the plant is to be largely increased shortly and other enlargements and improvements made. Their exact nature have not been decided upon as yet, however.

Good records are already being made at the new plant of the Union Steel Co., Donora, Pa., although in operation only about a month. One rod mill has already produced 301,230 pounds of rods in a 12-hour turn, and it is probable that the output of this mill will be increased to 400,000 pounds shortly. The wire drawing department has 300 drawing blocks in operation, producing 700 tons of wire daily. The wire nail department is producing 3,000 kegs of nails daily. At the present time a portion of the rod output of the plant is being sold, but a broom and mattress wire plant will shortly be installed to consume the surplus of rods manufactured. The new plant will be 400 feet long and 100 feet wide.

The Washington Charcoal Iron Tin Plate Co. at Washington, Pa., has placed an order with the Mesta Machine Co. of Pittsburg, Pa., for a new pickling machine. Orders have been issued to place the fifth hot mill in operation at this plant at once.

Preliminary plans are being prepared by engineers of the Westinghouse Machine and Westinghouse Electric & Mfg. Cos. for two of the largest foundries in this country, to be erected at Trafford Park, Stewart Station, Pa. The companies have secured 650 acres of land at this place and in addition to erecting these plants will build homes for their workmen. The foundries now located at Cleveland, O., Allegheny and Pittsburg, Pa., will be dismantled as soon as the new foundries are completed. The Westinghouse Machine Co. will erect its foundry first. It will cover a site of 25 acres and will turn out gray iron castings. Trafford Park will be the third town established by the Westinghouse interests on the Pennsylvania railroad since 1890. Wilmerding was established that year to find homes for its workmen employed in the Westinghouse Airbrake Works. In 1894 the plants of the Westinghouse Electric & Mfg. Co. were removed to East Pittsburg and that town established.

The United States Aluminum Co. of Pittsburg has been organized with $25,000 capital by the directors of the Pittsburg Reduction Co., for the purpose of erecting a plant to make finished articles from aluminum. The plant will be located at New Kensington, where the company's present works are located.

The West and Northwest:—

The Shultz Belting Co., St. Louis, Mo., is increasing the capacity of its plant 2¼ times, by the erection of a new building with 5,000 feet of floor surface and the installation of new engines and boilers.

The Modern Steel Structural Co., Waukesha, Wis., is erecting a new power house to be equipped with a 50-h. p. Nash gas engine.

The Northern Foundry & Machine Co., 228 Grove St., Milwaukee, Wis., has ordered a 30-ton electric crane from Pawling & Harnischfeger, Milwaukee.

The Bolivar Mills Smokeless Furnace Co., St. Louis, Mo., has been incorporated with a capital stock of $50,000. The incorporators are David A. Brislin, Frank Galennie and Robert T. Stilwell.

The Magnetic Separating Co., Joplin, Mo., has been incorporated to manufacture the Cleveland-Knowles magnetic separators.

Smith & Sons Mfg. Co., Kansas City, Mo., will add a foundry to its plant.

The Seibel-Suessdorf Copper & Iron Mfg. Co., St. Louis, Mo., manufacturers of perforated metal, has been incorporated with a capital stock of $25,000.

J. B. Doan & Co., South Canal St., Chicago, has sold a complete machine-shop equipment to the Illinois Steel Co., Joliet, Ill., also one to the Algoma Central Railroad Co., for installation in its repair shops at Sault Ste Marie, Ont.

McDowell, Stocker & Co., Chicago, has sold a shop equipment to the Burlington & Northern Railroad Co., for installation at Sheridan, Wyo.

The American Copper, Brass & Iron Works, Chicago, has purchased a tract of land at Wellington Ave. and North Paulina St., Chicago, on which it will locate its new plant.

The American Grass Twine Co. of St. Paul, Minn., last week assumed control of the plant of the Minnesota Malleable Iron Co. When the plant of the Walter A. Wood Harvester Co. was purchased by the American Grass Twine Co., the malleable plant was included in the purchase, but was under lease to the Minnesota Malleable Iron Co. The new company will continue the foundry along the same lines as its predecessor. In addition to making castings required in the manufacture of binders, considerable jobbing business will be done for the railroads.

The National Elastic Nut Co., Milwaukee, Wis., has found it necessary, owing to the large increase of its business, to increase its plant considerably, adding a new engine and several more machines.

The Dwiggins Wire Fence Co., Anderson, Ind., has recently been reorganized and the capital stock increased from $5,000 to $50,000. As soon as a satisfactory site can be decided upon, an entirely new plant will be built, which will be modern in every respect. The company is putting on the market a new type of wire fencing to be known as the "Victor Fence," which will be made from high carbon, steel, spring wire. The main feature of this fence is its tie, which is different from that used in any other fence. The manufacturers say for this tie, that while it is as strong and complete as any now being made, it does not destroy the fibre in the iron, it not being necessary to punch it as closely together as others. Several new machines are being especially built for

the manufacture of the "Victor Fence," and the company has otherwise increased the capacity of its plant, removing the office from the factory proper to separate and more commodious quarters.

The Vilter Mfg. Co., Milwaukee, has just started the erection of a new foundry, the dimensions of which are 270x110 feet; a new carpenter shop, two stories high, 144x44 feet; a new power house, including engine and dynamo room and boiler house, 100x60 feet. Modern tools and machinery will be installed throughout, the power house to be equipped with a Corliss engine of the company's own make. Electrical machinery for driving the different parts of the plant have been ordered, it being the company's intention later to operate all the machinery by motors, thus doing away with the present power house. The equipment for the foundry will include everything in the line of modern machinery and appliances, including two electric cranes, one of which will have a capacity of 30 tons, and one of 15 tons.

The Reeves Pulley Co., Columbus, Ind., is adding to its plant a one-story, brick, iron-working shop, 112x56 feet, with concrete floor, traveling crane and modern heavy iron working machinery, to be devoted exclusively to the manufacture of the larger sizes of "The Reeves" variable speed transmission machinery, such as are furnished paper manufacturers for regulating the speed of large cylinder rolls. The company is also building a blacksmith shop, and installing throughout the entire works modern sanitary appliances for the comfort and convenience of its employes.

The Chicago Malleable Castings Co., West Pullman, Ill., has recently installed in its foundry a 10-ton melting furnace, and it purposes, with its increased capacity, to branch out after new business. The company make a specialty of railroad, agricultural and malleable castings. It recently added a grey iron department, and will henceforth, make a specialty also of grey iron castings.

The Armstrong Bros.' Tool Co., Chicago, notes that the latest addition to its line of tool holders, the Armstrong gang planer tool, is meeting with ready sale wherever introduced. After having had several small lots of gang planer tools, the company's agents for Great Britain, Messrs Chas. Churchill & Co., Ltd., have just placed an order for 66 of them.

General Industrial Notes:—

It is probable that the Brooks Locomotive Works, Dunkirk, N. Y., will turn out its four thousandth locomotive before the end of the week. Last week the total output of the plant since its operation reached 3,980. When the four thousandth locomotive is turned out the employes will probably celebrate the event with a holiday.

The Canada Foundry Co. of Toronto, Can., has established an office at Winnipeg, Man. C. E. Mackenzie is in charge of the branch office.

The offices of the Lackawanna Iron & Steel Co., together with the entire office force were removed last wek from Scranton, Pa., to Buffalo, N. Y., where the company's new plant is under erection.

Two sheet mills of the Stark rolling mill plant at Canton, O., were placed in operation last week. Two additional mills will be placed in operation shortly and the entire plant will be operating within a few weeks.

Work on the erection of the new furnace to be built by the Central Iron & Coal Co. at Tuscaloosa, Ala., will be commenced at an early date.

No effort will be made for some time to operate the 8-inch mill at the Bay View plant of the Illinois Steel Co., owing to improvements that have been recently decided upon. A roughing device will be attached to the mill which it is believed will displace the rougher. The machine is known as an automatic rougher and according to current reports is a success.

The plant of the Franklin Forge Co., Chester, Pa., is now being operated night and day, owing to the pressing orders on hand.

The sale of the plant of the J. C. McNeil Boiler Co., Akron, O., has been postponed until Nov. 23, by order of the court. A plan of reorganization has been decided upon and the claims of the creditors who insisted upon the sale have been purchased by stockholders of the company. The court set the date for the sale so far in the future at the request of the stockholders in order that the scheme of reorganization might be carried out.

The new plant of the Canton & Cleveland Spring Co., Canton, O., is nearing completion and will be placed in operation in about ten days.

The foundry of the Western Tube Co.'s new plant at Kewanee, Ill., will soon be completed and placed in operation. The cupola house is 50x34 feet, while the engine and boiler house is 90x34 feet. The sand and coke sheds are 90x24 feet and 70x24 feet respectively. An addition is being built to the pipe finishing mill 150 feet in length.

The Republic Iron & Steel Co. has purchased two blowing engines, 1,100-h. p. each, from the Weimer Machine Co., of Lebanon, Pa. One of the engines will be installed at the Hannah furnace of the Valley plant, Youngstown, O., and the other will be installed at the Laura furnace plant, Haselton, O. A pair of Weimer engines recently installed at the Hanna furnace were placed in operation last week.

Owing to the continuation of the machinists' strike it has been practically decided by the owners of the Oakland Iron Works, Oakland, Cal., to remove the plant to some Eastern point. President Charles S. Booth recently stated that the plant could not be operated advantageously as at present located and it is probable that nearly all the machinery will be removed to the new site already secured at an early date.

Breaking Records at Edgar Thomson.

On Sept. 23, new records were established at the Edgar Thomson plant of the Carnegie Steel Co., Braddock, Pa. On that day the day turn made 106 blows and 1,602 tons of ingots. The night turn made 119 blows and 1,789 tons of ingots, a total of 3,391 tons of ingots in 24 hours. The day turn in the blooming mill made 107 heats and turned out 1,435 tons, the night turn made 118 heats and turned out 1,545 tons, a total of 2,980 tons of ingots bloomed in 24 hours. On the same day, No. 1 rail mill turned out 2,185 tons of finished rails. A smaller mill turned out 545 tons of rails, making the total production of 2,730 rails in 24 hours. These records for output have never been equalled. During the month of September the output of ingots and rails was the greatest in the history of that record breaking plant. The total tonnage of ingots amounted to 74,400 tons, of which the blooming mill broke down 65,310 tons and the rail mill finished 59,810 tons. All previous records for rolling structural shapes at the structural mill at Homestead, Pa., were also broken for the same month by about 3,500 tons.

F. N. Hoffstot, president of the Pressed Steel Car Co., last week gave out the following: "The net earnings of the company for the first quarter ending March 31, this year, were $439,330, of which $306,603 was applied to the payment of the quarterly dividend on preferred stock and interest charges and depreciation, leaving a net surplus for the first quarter of $132,727 for the common stock. The net earnings for the second quarter, ending June 30, were $642,369, of which $290,780 was applied to the payment of the quarterly dividend on the preferred stock, and interest charges and depreciation, leaving a net surplus for the second quarter of $351,589 for the common stock. This shows a total surplus for the first six months of this year, after paying preferred dividends, and making deductions for all interest charges, depreciation, etc., of $484,316 for the common stock." The Pressed Steel Car Co. will hereafter issue quarterly reports for the benefit of its stockholders, following the example set by the United States Steel Corporation."

At a conference held last week between representatives of the Buffalo Foundrymen's Association and the molders' union, the threatened strike of the molders of Buffalo and vicinity was averted, a compromise having been affected. The men demanded a straight 10 per cent advance and a minimum of $2.75 per day instead of $2.50. The foundrymen offered to compromise by giving the men an advance of 15 cents per day which was accepted. The new agreement will remain in force until Oct. 1, 1902.

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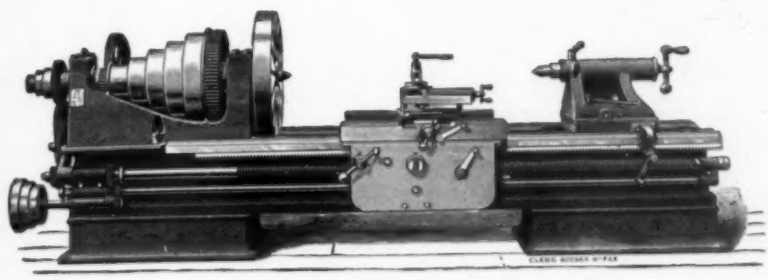

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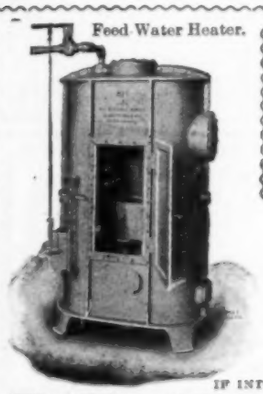

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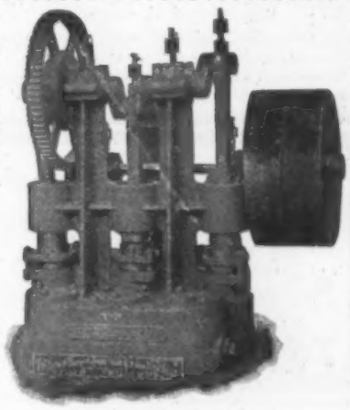

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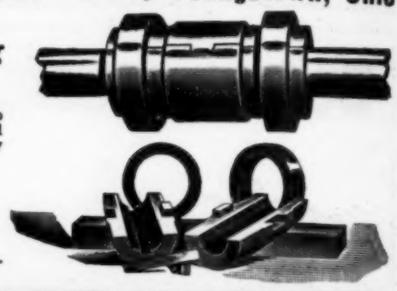

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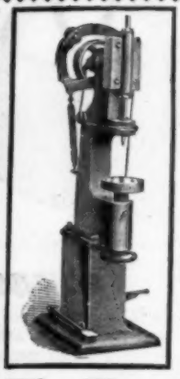

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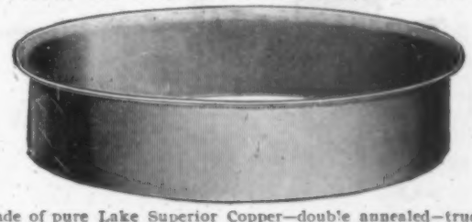

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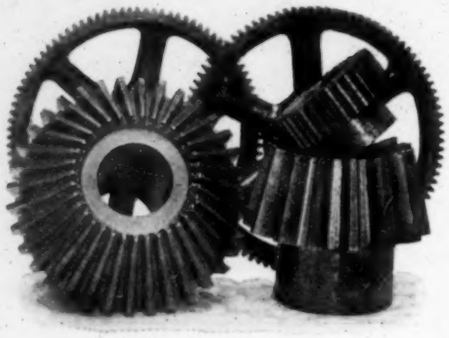

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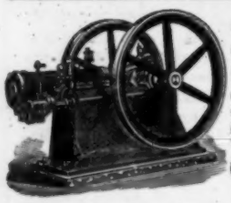

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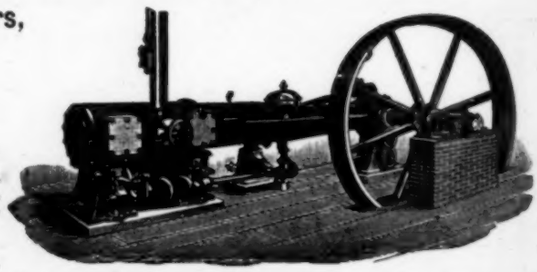

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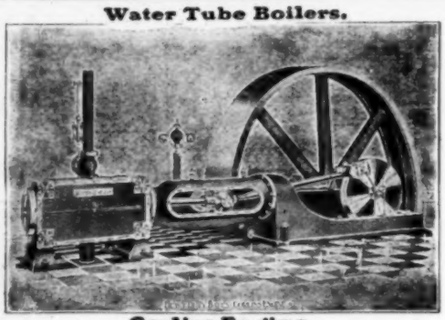

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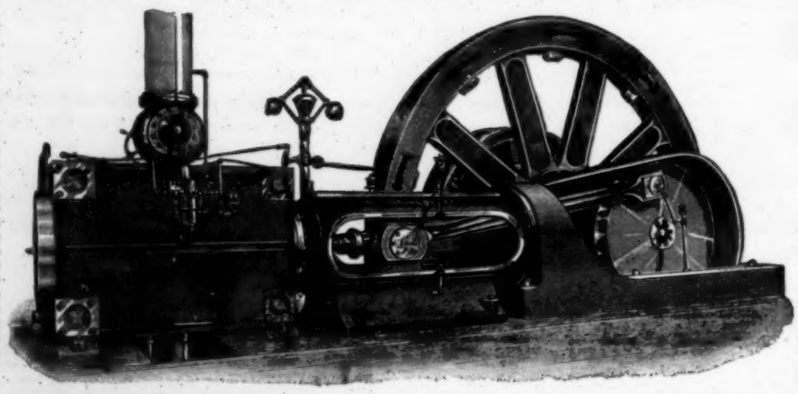

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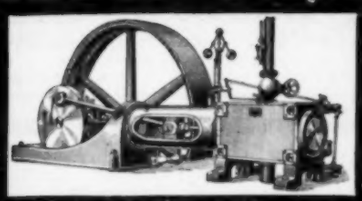

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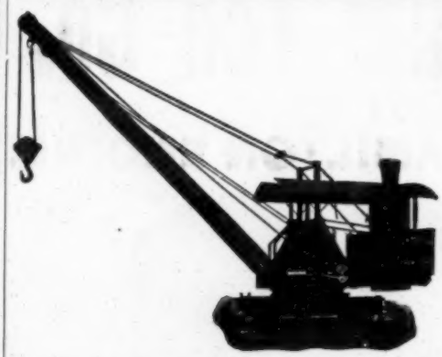

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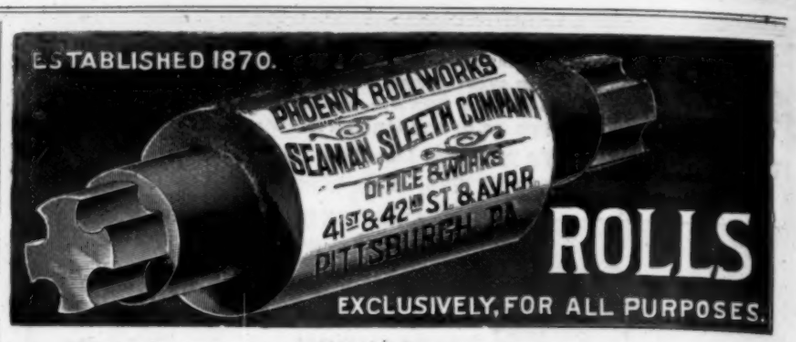

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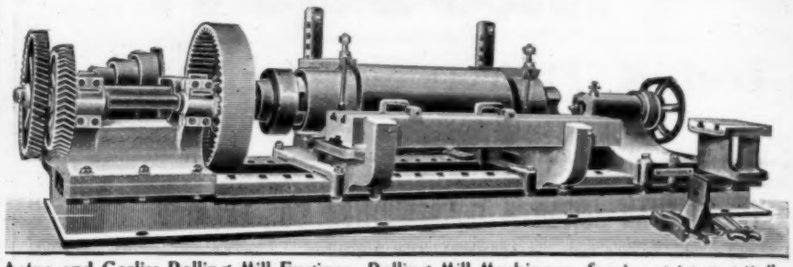

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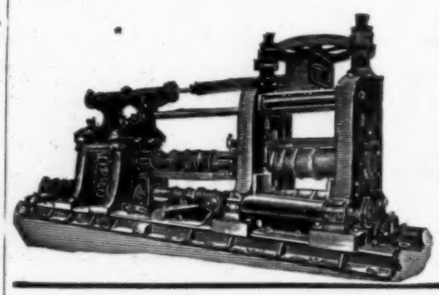

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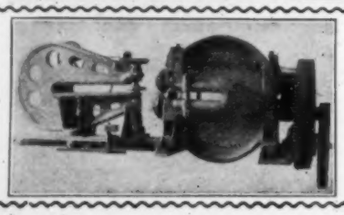

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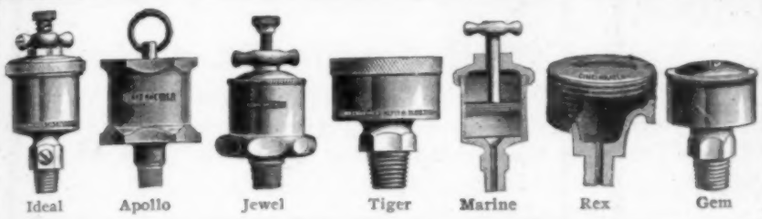

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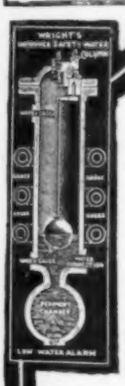

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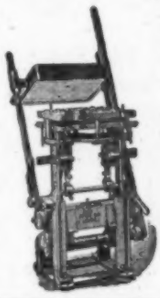

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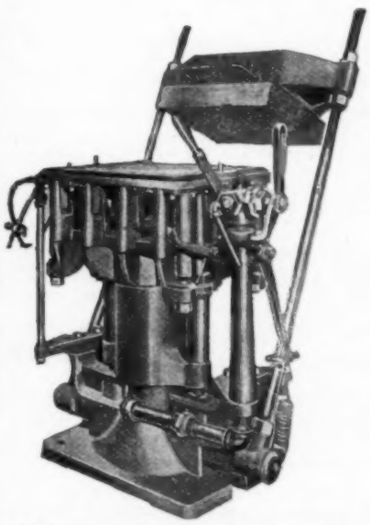

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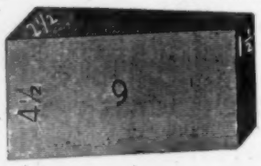

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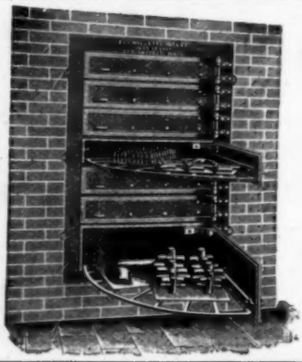

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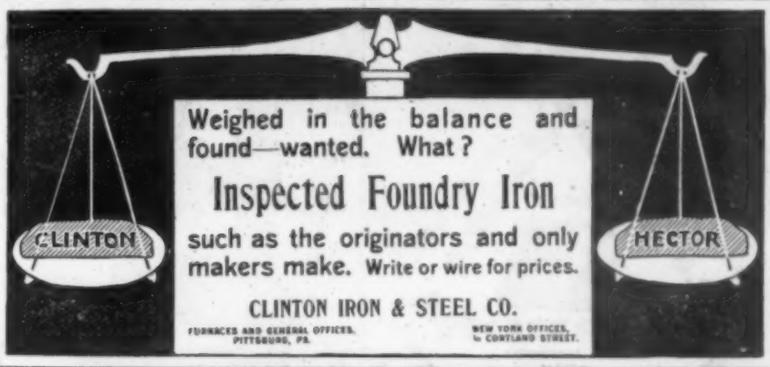

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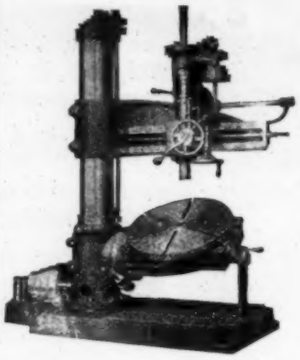

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